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# **USSR Report**

**CONSTRUCTION AND EQUIPMENT**

**No. 10**



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7 May 1980

# USSR REPORT

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No. 10

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## CONSTRUCTION

### LONG RANGE GENERAL FORECASTS FOR CONSTRUCTION INDUSTRY

#### Automation Plans

Moscow BYULLETEN' STROITEL'NOY TEKHNIKI in Russian No 2, Feb 80 pp 6-11

[Article by V. V. Semkovskiy, deputy chief of the Division of Mechanization of Construction of USSR Gosstroy: "The Plan for Full Mechanization and Automation of Construction and Installation Work in 1980"]

[Text] The November 1979 decree of the Plenum of the CPSU Central Committee demands a definitive improvement in the situation with capital construction, a rise in the efficiency of capital investment, a reduction in the number of new construction starts, concentration of personnel and machinery at start-up projects and in reconstruction and technical reequipping of existing enterprises, and a rise in the quality of construction.

The second session of the USSR Supreme Soviet 10th convocation ratified the State Plan of Economic and Social Development of the USSR for 1980 which was approved by the November 1979 Plenum of the CPSU Central Committee. The 1980 plan envisions a large program of capital construction. The volume of state capital investment is set at 119.1 billion rubles and labor productivity in construction is to rise 3.5 percent.

The board of directors has reviewed and USSR Gosstroy has ratified the 1980 plan of full mechanization and automation of construction and installation work. It contains assignments to reduce the volume of work done manually, raise the level of mechanization and automation of construction and installation, improve the use of construction machinery and trucks, and increase centralized machine repair. The plan aims to raise labor productivity in construction. The plan assignments were established with due regard for demands for a rise in the efficiency of construction in light of the CPSU Central Committee and USSR Council of Ministers decree entitled "Improving Planning and Strengthening the Impact of the Economic Mechanism on Raising Production Efficiency and Work Quality."

During the 10th Five-Year Plan full mechanization developed, the volume of the primary types of work done manually was reduced, and the use of construction machinery improved. However, there are still substantial unused reserves for raising the efficiency of construction by further improvements in mechanization.

The volume of particular types of work done manually is increasing in the construction organizations of the various ministries and departments. In the first six months of 1979 the volume of manual earthwork per 1 million rubles compared to the first six months of 1978 rose in the construction organizations of Lithuania, Latvia, Kirgizia, Tadzhikistan, and Turkmenistan, resulting in a lag in fulfillment of assignments set for 1979.

The volume of concrete work done with manual labor is decreasing slowly at construction projects of the Ministry of Construction of Petroleum and Gas Industry Enterprises, while the volume of work using manual labor has increased at construction sites of the USSR Ministry of Rural Construction, the Ministry of Transport Construction, and in several Union republics. The volume of plastering work done manually per 1 million rubles of construction and installation in the first half of 1979 increased at construction sites of the Ministry of Transport Construction and the Moscow City Executive Committee. The level of automation in preparation of concrete mix and mortar is rising slowly at construction sites and enterprises of the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Industrial Construction, the USSR Ministry of Rural Construction, and the Moscow City Executive Committee.

The construction ministries and departments are not making full use of existing reserves for raising the efficiency of operation of construction machinery and transport vehicles. As report data show, the average working time of machines per day is rising slowly and has practically stopped at the level of 10-12 hours. There is substantial above-norm downtime for machines in repair, and as a result established assignments for the output of various basic machines are not being fulfilled.

Equipment downtime within shifts often reaches 18-20 percent because of organizational mistakes (especially failure to supply materials and design components to construction sites on time). Elimination of such downtime requires improvement in the planning and organization of construction and installation work.

Some construction organizations have not yet completed the concentration of machinery at mechanization administrations and trusts; to do so would raise the technical level of machine exploitation. Others underestimate the role of mechanization trusts and administrations in organizing the work of machines and increasing their impact on the

technology of construction processes. They fail to observe the account procedure established by the basic statutes on the tasks and functions of mechanization trusts and administrations ratified by USSR Gosstroy.

At the present time when the use of machinery in large part determines the efficiency of the technological processes of construction, work volume, and time of performance, improving the organization of machine work and insuring that the machines are ready to work is an important and essential condition for successful performance of assignments.

The construction organizations have accumulated a good deal of working experience with efficient use of machinery and progressive methods of organizing the work of machine operators. Digging and hauling earth with composite brigades composed of excavator operators and truck drivers raises the productivity of the trust and construction machinery 25-30 percent. Concentrating scrapers in specialized divisions, supplying scraper detachments with push tractors, and introducing progressive work methods make it possible to double or triple their output and reduce the labor-intensiveness and cost of earthwork. Containerization and stacking significantly reduce the labor-intensiveness of loading work, but container shipping is developing very slowly.

A practice that deserves broad dissemination is paying for the work of construction cranes on the basis of normative time of operation. When a construction organization and mechanization administration use this form of payment it becomes necessary to plan the work of the crane carefully with due regard for the concrete conditions of the construction project, crane productivity, and the existing system for supplying parts and materials. In other words, the work of the crane and the organization of work at the construction site must be coordinated. This procedure increases the accountability of the parties for use of the machinery and observation of violation of the technological sequence of jobs results in extra jobs which are done manually, which is a poor use of equipment. Therefore, mechanization trusts and administrations should insure technological coordination of work at the construction site by different types of construction machines, solve ongoing questions related to insuring machine work during the construction process, and maintain the machines in working condition. They must have an active impact on the intensity of the construction process.

A great deal of labor-intensive work must be done by the planned group of ministries and departments to accomplish the capital construction program ratified for 1980 (see Table 1 below).

The plan provides assignments for reducing the volume of work done manually, calculated per 1 million rubles of construction and installation work as a percentage of the volume of work in 1975. With growth in the overall volume of work, the following decreases in physical volumes of work done manually per 1 million rubles of construction and installation

Table 1. Volume of Basic Construction Jobs

Type of Work	1979 (Anticipated)	1980 (Plan)	1980 as % of 1979
Earthwork, millions of m <sup>2</sup>	13,851	14,296	103.2
Loading Work, millions of tons:			
Non-Ore Materials	1,064	1,121	105.4
Construction Components and Lumber	726.2	743.8	102.4
Cement	48.2	50.1	103.9
Concrete Work, millions of m <sup>2</sup>	82.5	86.3	104.6
Plastering, millions of m <sup>2</sup>	382.3	400.2	104.7
Painting, millions of m <sup>2</sup>	966.5	973.4	100.7

work on the average for the planned group of organizations are envisioned: earthwork — 27.8 percent; concrete work — 26.1 percent; plastering — 27.2 percent; painting — 24.5 percent; loading and unloading non-ore materials — 29.8 percent, construction components, lumber, and metal — 33.3 percent, and cement — 30.8 percent.

Reducing labor inputs while performing construction jobs is a complex task and must be accomplished by improving design decisions, raising the level of factory readiness of parts and design components, strict compliance with the technological sequence of jobs and particular operations, and improving the supply of materials and components to construction sites.

Large volumes of manual work are done in plastering, painting, and other finishing work. Reducing labor-intensiveness and raising labor productivity in these jobs depends primarily on the degree of availability of small power equipment and introduction of standard sets of machinery. In addition to increasing the supply of small power equipment it is important to improve its use.

Small-scale mechanization trusts and sections have been formed in construction and their number increases each year. Useful experience with efficient use of small power equipment has been accumulated at organizations of the USSR Ministry of Power and Electrification, the USSR Ministry of Construction of Heavy Industry Enterprises, the USSR Ministry of Industrial Construction, and elsewhere. However, these questions are not being solved properly in all places yet.

In the next two or three years the ministries and departments must complete the concentration of small power equipment in specialized subdivisions. These subdivisions are assigned to provide power tools, finishing machines, and other necessary technological equipment to employees, to adjust and maintain this equipment in working condition, and to instruct workers in the use of new small power equipment. Steps should be taken to organize the tool system in construction. According to the plan, an additional seven small power equipment administrations and 26 sections to handle small power equipment should be formed in 1980.

The construction ministries and USSR Gosstroy have suggested that USSR Gossnab should reach a decision on centralized allocation of funds for power tools and equipment for finishing work in construction beginning in 1981 to be realized through territorial supply administrations. This will allow the ministries to distribute the allocated resources more correctly with due regard for the level of supply at particular organizations and the planned work volumes. According to established procedure, before 1 April 1980 the ministries must submit data on 1981 requirements for small power equipment to Gossnab accompanied by essential calculations and substantiation. This is very important work and should be managed by the main administrations of construction mechanization of the construction ministries.

In conformity with the ratified plan, the volume of work done by progressive mechanized methods will continue to expand in 1980. Thus, the volume of earthwork done by scrapers is to rise to 1,478,500,000 cubic meters and the volume of earthwork and quarrying done by hydro-mechanical equipment will increase to 519,600,000 cubic meters. The level of mechanization of roofing work for the planned group of organizations is expected to rise to an average of 44.8 percent.

The plan envisions a further increase in the use of automated suction dredges and trench excavators with automatic control of working elements and an increase in the level of automation in preparation of concrete mixes and mortars. The volume of earthwork done by automated suction dredges and trench excavators with automatic control of working elements will be 288.3 million cubic meters in 1980. The volume of preparation of concrete mixtures at automated plants and installations will rise from 80.6 to 103.5 million cubic meters. The volume of preparation at automated installations will increase from 16.7 to 20.9 million cubic meters. Overall, this will enable the planned group of construction ministries, departments, and construction organizations of the Union republics to raise the level of automation of preparation of concrete mixtures in 1980 to 50.9 percent and the level for mortar to 40.3 percent.

The development of mechanization and reduction in the volume of work done manually depend on improving the structure of the fleet of



machines and equipping construction organizations with efficient new machinery. The 1980 plan envisions operating tests of new construction machines and small power equipment developed as the result of scientific research and study of progressive domestic and foreign know-how. Among the subjects to be covered are: ETR-134 rotary excavators for digging trenches in frozen ground; EO-3322B grading excavators with bucket capacities of 0.5 cubic meters for grading work with a semi-automatic control system; pneumatic hammers for excavators to loosen frozen ground and break up concrete and reinforced concrete during reconstruction of buildings and roads; mobile hydraulic cranes on special truck frames with carrying capacities of 25, 40, and 63 tons; powerful bulldozers with ground-breakers on 25-ton industrial caterpillar tractors, designed for working frozen and heavy ground; new self-propelled double-motor scrapers with capacities of 15 cubic meters, which raise productivity to 60 percent compared to single-motor machines; scraper-earthmover machines based on the T-130 tractor and designed to strip layers of frozen ground or asphalt concrete surfaces during road reconstruction and repair; SB-126 cement trucks on KamAZ frames with productivity of 65 cubic meters an hour; SB-131 conveyor-type concrete layers based on the T-130 tractor and designed to receive and haul concrete with coarse aggregate when laying foundations.

A whole series of new machines is to be tested to eliminate manual labor in finishing jobs. Among them are painting aggregates that apply paint compounds hydrodynamically without air, which improves the working conditions of the workers and saves 15-20 percent of the paint. Other equipment to be tested includes: machines to prepare and haul hard compounds with a productivity of 2.5 cubic meters an hour; SO-113 self-propelled broad-swath machines to polish mosaic and concrete floors with a productivity of 50-60 square meters an hour; "vintoverty" [translation unknown] with magnetic heads to secure sheets of dry gypsum plaster; SO-125 machines to install roof stays with a productivity of 400 square meters a shift; blade-type machines to smooth concrete floors with productivities of 70-100 square meters an hour, and others. Testing the work of these machines and pieces of small power equipment at construction projects of the ministries and departments will help speed up their introduction, raise the labor productivity of workers, and reduce manual labor.

The plan establishes assignments for ministries and departments with respect to further improvement in the use of machines in construction. The average output of earthmoving machines should increase 3-6 percent compared to report figures for 1978 and the output of boom and tower cranes should rise 6-12 percent. Table 2 below shows the assigned output levels for earthmoving work in the primary ministries in 1980.

The construction organizations of the ministries and departments have significant reserves for improving the use of machines by increasing the shift coefficient of their work, reducing intrashift downtime,



Table 2. Output of Earthmoving Machines

Ministries	A. Excavators	B. Scrapers	C. Bulldozers
USSR Ministry of Power and Electrification	106,000	6,500	42,000
Ministry of Construction of Petroleum and Gas Industry Enterprises	109,000	4,000	38,000
USSR Ministry of Land Reclamation and Water Resources	152,000	8,600	93,000
USSR Ministry of Construction of Heavy Industry Enterprises	111,500	6,000	38,000
USSR Ministry of Industrial Construction	110,000	5,000	38,500
USSR Ministry of Construction	130,500	5,000	43,000
USSR Ministry of Rural Construction	73,000	4,100	24,000
Ministry of Transport Construction	107,000	5,600	16,000
USSR Ministry of Installation and Special Construction Work	126,000	6,600	31,000

Key: (A) Single-Bucket Excavators, cubic meters per meter of bucket capacity;  
 (B) Scrapers, cubic meters per meter of bucket capacity;  
 (C) Bulldozers, cubic meters of earthwork per standard 100-horsepower bulldozer.

and improving mechanical maintenance and repair. At the same time, it must be observed that the rate of growth in machine output is affected not only by existing shortcomings in the organization of production but also by the age structure of the machinery and problems with the supply of spare parts and equipment for mechanical maintenance and repair.

To raise the technical level of repair for construction machinery and improve the use of the capacities of repair enterprises, the following assignments for centralized repair of basic construction machines have been envisioned for 1980 (percent of total volume of machine repair): single-bucket excavators - 75 percent; self-propelled scrapers - 74.8; bulldozers - 75.7; truck cranes - 75.2.

One of the most important steps to raise the technical level of machine use and repair is introduction of the new normative document "Recommendations on the Organization of Mechanical Maintenance and Repair of Construction Machinery," which envisions implementation of scheduled preventive maintenance systems based on machine time worked (in motor hours). This makes it possible to perform mechanical maintenance and repair on machines at technically sound times. The recommendations

define the types of mechanical maintenance and repair and schedules for this work for each type and kind of primary machine based on the instructions given in the operating and repair documents provided by manufacturing plants. They contain requirements for construction organizations with respect to keeping records of machine time worked and mechanical maintenance and repair operations performed.

Introduction of the recommendations will permit a significant reduction in expenditures of labor and money for mechanical maintenance and repair of machinery and raise the level of machine use. At the same time, examination shows that a number of construction ministries have not yet taken the essential steps to introduce the recommendations.

Improving the organization of work and use of trucks has a significant impact on the course of construction. In conformity with the 1980 plan the productivity of trucks, in tons per average registered vehicle ton, should increase 4.5 percent compared to 1978 and, in ton-kilometers, 5.5 percent. Table 3 below shows the assignments of particular ministries for truck productivity.

Table 3. Productivity of Trucks per Average Registered Ton, per year

Ministries	Productivity	
	Tons	Ton-Kilometers
USSR Ministry of Power and Electrification	2,165	30,800
USSR Ministry of Land Reclamation and Water Management (USSR Organizations)	1,400	29,500
USSR Ministry of Construction of Heavy Industry Enterprises	3,000	30,000
USSR Ministry of Industrial Construction	2,700	31,300
Ministry of Construction of Petroleum and Gas Industry Enterprises	1,560	37,000
USSR Ministry of Construction	2,770	31,500
USSR Ministry of Rural Construction	1,564	34,790
Ministry of Transport Construction	2,600	27,300
Ministry of Installation and Special Construction Work	960	26,000

The volume of centralized shipping should be 59.9 percent. In 1980 85 diagnostic lines and positions at motor pools, 94 mechanical maintenance flow lines, and more than 19,000 posts equipped to heat engines during the winter will be put into use. Washing units equipped with water recycling capable of handling about 21,000 vehicles are to be put into operation.

In conformity with the plan the construction ministries and departments should manufacture 5,070 specialized railroad cars for shipping construction freight. The proportion of container and stack shipments should be 24.7 percent. Of the total volume of concrete and mortar shipping 25.7 percent should be shipped on hourly schedules.

The ministries and departments must take steps to improve the organization of construction and supply construction sites with construction components, parts, and materials at the proper time in the full amount. Concrete steps must be taken to reduce labor inputs at the construction sites, raise the technical level of machine use and repair and the shift coefficient of machine work, and introduce the brigade contract and other progressive work practices broadly.

Fulfillment of the assignments of the plan for comprehensive mechanization will promote a rise in the technical level of construction, growth in labor productivity, and fulfillment of the assignments set before capital construction for 1980.

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#### Capital Construction, Labor

Moscow MEKHANIZATSIYA STROITEL'STVA in Russian No 2, Feb 80 pp 2-4

[Article by R. R. Kormilitsyn: "Fulfill and Overfulfill the Assignments of the Final Year of the Five-Year Plan"]

[Text] 1980 is the year of Lenin. The CPSU has decreed that the 110th jubilee of the birth of V. I. Lenin be celebrated as a major national holiday, concentrating attention on the current challenges of building socialism.

Our country has made enormous progress in the first four years of the five-year plan. Even larger and more important challenges must be met in the final year. This is persuasively shown by the resolutions of the November 1979 Plenum of the CPSU Central Committee and the minutes of the second session of the USSR Supreme Soviet, Tenth Convocation, which discussed drafts of the State Plan for Economic and Social Development of the USSR and the State Budget for 1980 and adopted appropriate decrees and laws.

The great, vivid speech by General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev, presented at the Plenum of the CPSU Central Committee, contains a program of action with enormous mobilizing force.

The materials of the session of the USSR Supreme Soviet observed that growth in national income, a generalizing index of economic progress, will increase by 16.2 percent or 323 billion rubles during the

four years compared to the corresponding period of the Ninth Five-Year Plan. By the end of 1979 fixed productive capital, almost one-third of it new, exceeded 1 trillion rubles in value and capital investment went past the 500 billion ruble mark. Hundreds of enterprises have been built, including such giants of industry as KamAZ, the Sayan-Shushenskaya hydroelectric power plant, and Atomash. More than 1,500 kilometers of track has been laid on the Baikal-Amur Mainline.

The material and cultural standard of living of the people has risen significantly. Per capita personal income rose by more than 13 percent in the first four years of the five-year plan; more than 420 million square meters of housing and many nursery schools, general schools, hospitals, and cultural institutions were built.

"We have made progress, considerable progress," said L. I. Brezhnev. "We see it as a good foundation for meeting the national economic challenges of 1980, for a confident advance along the path of building the material-technical base of communism."

This does not mean, however, that we can be entirely satisfied with work results. Tension continues to exist in certain segments of the economy. Various ministries and departments have not yet overcome their inertia and fully negotiated the turn toward quality, raising labor productivity, and achieving optimal final results. The results are less than we are capable of.

In his talk at the Plenum of the CPSU Central Committee Comrade L. I. Brezhnev gave a comprehensive analysis of the situation in capital construction and pointed to ways of improving it. He emphasized that more than one-fifth of national income goes for capital construction each year, and how this money is used determines the indexes of our economy, the rate of scientific-technical progress in the country, and the efficiency of production. Construction timetables frequently drag out, however, incomplete construction significantly exceeds norms, and resources are often applied on projects of secondary importance.

The Plenum noted the necessity of raising the efficiency of capital investment, reducing the number of new construction starts, concentrating personnel and equipment at start-up projects and reconstruction and technical re-equipping of existing enterprises, and improving construction quality.

The program of capital construction for 1980 was formed on the basis of material and financial capabilities and the available capacities of the contracting organizations of the construction ministries. The volume of state capital investment is 119.1 billion rubles, which is 6.6 billion rubles more than outlined in the five-year plan for its final year.

The plan envisions a higher rate of growth in capital investment for railroad transportation and such sectors as electric power, fuels, chemicals, ferrous and nonferrous metallurgy, heavy and transport machine building, electrical engineering, machine building for light and food industry, domestic appliances, and a few others. Capital investment in the primary industrial sectors producing consumer goods will increase significantly. The volume of construction and installation in light industry will increase 55 percent compared to 1979, while in the food industry it will rise 15 percent and in the meat and dairy industry 19 percent.

It is well-known that labor productivity in capital construction is behind plan assignments. A large proportion of construction work is done manually. Furthermore, a number of construction organizations even permitted an increase in the volume of certain types of work done manually last year. The amount of manual labor is particularly high in finishing jobs, masonry, roofing, and certain other types of work. Full mechanization often cannot be accomplished because of a shortage or complete lack of the equipment required to mechanize particular production processes, especially subsidiary and finishing work. There is no question that taking planned steps to expand production and improve quality of manual and power construction tools, finishing machines, and other small power equipment for construction will make it possible to correct the situation in large part.

The rise in labor productivity in construction is still being retarded by inadequate dissemination of the brigade contract and other developments.

To successfully meet the assignments of the 1980 plan and budget the construction ministries must take concrete steps to improve the organization of construction and raise labor productivity. Needless to say, this will demand great intensity in the work of all subdivisions of the sector, including the machine operators.

The experience of numerous leading organizations and brigades working on the basis of brigade contracts confirms the possibility of achieving maximum impact from equipment use by this method.

Two years ago the board of directors of the USSR Ministry of Construction of Heavy Industry Enterprises and the Presidium of the Central Committee of the Trade Union approved the patriotic initiative of the collectives of the best comprehensive mechanized brigades headed by Heroes of Socialist Labor K. S. Spiryukhov (Soyuztyazhekskavatsiya [USSR Heavy Excavation] Trust) and F. F. Vereshchagin (Yuzhuralspetastroy [Southern Ural Special Construction] Trust), A. I. Guley (Rostov-na-Donu Stroymekhanizatsiya [Construction Mechanization] Trust), and G. G. Kayko (Dneproekskavatsiya [Dnepr' Excavation] Trust), who obligated themselves to fulfill their assignments for the



Tenth Five-Year Plan in 2.4-4 years by introducing the brigade contract.

The initiative of these leaders was taken up by many collectives and their experience with forming comprehensive mechanized contract brigades spread widely. In 1979 there were more than 500 such brigades working at construction sites of the ministry. They moved more than 115 million cubic meters of earth, which was one-fifth of the entire volume of earthwork. It should be noted that the brigade contract is being introduced with particular effectiveness at specialized trusts and administrations which do earthwork and other jobs by mechanized means.

The experience of machine operators in the USSR Ministry of Power and Electrification and various ministries and departments has confirmed that the most advantageous form of labor organization, for example in earthmoving work, is the brigade contract performed by comprehensive mechanized brigades. This method makes it possible to use construction machines and motor vehicles most fully, raise labor productivity, improve the quality of work and save time, and conserve considerable amounts of materials. This form of brigade contract worked out very well in construction of the Smolensk and Rostov atomic power plants, the Riga hydroelectric plant, and other power plants.

Work on construction of the 1980 Olympiad ASU [possibly Automated Control System] was done by the brigade contract method in 1977-1978, and labor expenditures were cut 32 percent compared to normative figures while 44,200 rubles was saved by reducing the estimated cost of jobs.

The progressive work organization practices of the best comprehensive mechanized brigades of the Ministry of Power and Electrification were featured at the Exhibition of the Achievement of the USSR National Economy and have been recognized with diplomas and medals. By generalizing this work experience the Energostroytrud [Energy Construction Labor] Institute quickly developed and published "Instructions on the Formation of Comprehensive Brigades of Machine Operators, Drivers, and Construction Workers in Earthmoving Jobs and Switching These Brigades to Work on the Economic Accountability Method" supplemented by standard technical norms for comprehensive mechanized brigades working by the brigade contract method.

At the same time we cannot fail to observe that the scope and pace of dissemination of the contract method of organizing machine operator work are still plainly inadequate: it accounts for just one-fourth or one-fifth of such comparatively simple jobs as excavation and hauling of earth at the construction ministries. The main thing preventing machine operators from switching to the contract, in the opinion of many production workers, is inadequate concentration of construction machinery at specialized organizations.



The specific features of the work of machine operators offer a realistic opportunity for graphic records of the indexes of their work and propaganda for the achievements of the leading collectives and individual record-setters. It might be useful in the future to organize socialist competition for the construction sector as a whole, without limiting it to particular ministries or groups of cities.

The precious know-how of highly qualified foremen, leaders of socialist competition, and active advocates of technical progress and progressive forms and methods of labor organization must be used even more fully.

Among the winners of the USSR State Prize for 1979 was a large group of construction workers who received this lofty award for outstanding advances in labor on the basis of brigade economic accountability and developing the initiative of the workers of Sverdlovsk under the slogan "Complete the Brigade Five-Year Plan Assignment with Fewer Personnel!"

Innovation is a character trait of Hero of Socialist Labor I. P. Demin, manager of one of the best brigades of Moscow Home Building Combine No 3. Readers of the journal are already familiar with this collective, headed by the 1979 prize winner, for their remarkable effort to make fullest use of the construction machinery and tools entrusted to them and their initiative in introducing brigade economic accountability. The plan allows the brigade to have 40 members, but it works with 37 and exceeds its output quotas day after day: instead of 3.8 square meters of usable space each day it prepares 7.3 square meters for use.

All the new winners of the USSR State Prize have mastered the secrets of their professions. Among them are Boris Diduk, leader of a welding installation brigade from Tyumen', Nina Yarushnikova, leader of a brigade of plasterers in Sverdlovsk, Belorussian bulldozer operator Oleg Tishkevich, and other leaders of the sector.

Broad dissemination of the work methods and procedures of these remarkable workers is one of the primary concerns of economic and trade union leaders and scientific-technical organizations in the construction industry.

The organization and technology of construction and installation work are improving rapidly in our day; construction sites are being supplied with complex and diverse equipment and tools. This demands a steady rise in the level of education and job qualifications of the workers.

This goal is set forth in the recently adopted decree of the CPSU Central Committee and USSR Council of Ministers entitled "Steps Toward Further Improvement in Training and Raising Qualifications of

Workers in Production." This document notes that the level of training and retraining of workers in the common occupations is still not adequate to current challenges. As a result, the incorporation of new equipment, small power tools, and conventional tools often goes slowly, which also slows down growth in labor productivity. Among other important measures the decree envisions supplying training combines with the necessary aids, equipment, and technical means in the near future. In this connection there should be a careful analysis and consideration of experience already accumulated, for example at Glavvostoksibstroy [Main Administration for Construction in the Regions of Eastern Siberia], where a firm policy has been adopted of expanding and building up training combines and posts. In Irkutsk, for example, more than 1,000 highly skilled machine operators and construction workers are trained each year, and the city also has a methods group for the entire system of production training.

Speaking at the November Plenum of the CPSU Central Committee on the subject of raising labor productivity and improving the use of labor resources, Comrade L. I. Brezhnev posed the challenge of accelerating the mechanization of manual labor, especially heavy manual labor.

A successful and rapid solution to this problem is unthinkable unless there are fruitful contacts between science and production. The Ukraine has accumulated valuable experience in such cooperation. Construction workers there have been helped greatly by the Scientific Research Institute of Construction of Ukrainian SSR Gosstroy, whose activities have been discussed in detail in this journal more than once. As an example, scientists and engineers from just one branch of this institute, in Voroshilovgrad, with the active participation of the oblast scientific-technical organization of the construction industry, have introduced more than 30 developments into production in the last three years with an economic impact of more than 5 million rubles.

One of the largest and most interesting projects of the Voroshilovgraders is a method for optimal composition and distribution of the stock of construction machines at sites and forming and distributing stocks of machinery by types, models, and capacities. The results have been quite noteworthy: an optimal set of machines makes it possible to raise productivity by roughly one-fourth. It was formerly thought that the construction organizations of the oblast did not have enough machines. Workers in the oblast were able to do the same thing with small power equipment; by introducing the progressive methodology of NIISP [Scientific Research Institute of Construction of Ukrainian SSR Gosstroy] for calculating the machine-worker ratio of construction organizations, the output of this equipment in monetary terms was raised tens of thousands of rubles in the oblast.

It should be observed that in addition to work with NIISP the construction organizations of the oblast are constantly cooperating with 20 other scientific research and experimental design institutes and departments of higher educational institutions and participate in a contract of cooperation with the Academy of Sciences Ukrainian SSR.

Such broad ties between Voroshilovgrad construction workers and scientists were promoted by the constant aid of the oblast party organization, which has formed a council to assist in practical introduction of scientific-technical advances to carry out the decree of the CPSU Central Committee and USSR Council of Ministers of July 1978 entitled "Steps to Raise the Efficiency of Scientific Research in the Fields of Construction, Architecture, Building Materials, and Construction and Road Machine Building and Accelerate Practical Introduction of Scientific Advances in Construction."

The CPSU Central Committee Decree entitled "The 110th Anniversary of the Birth of V. I. Lenin" envisions a whole series of important political activities. "Their common denominator," Comrade L. I. Brezhnev stressed, "is to make 1980 a year of shock work, to work Lenin-style."

The principal tasks of labor collectives in the final year of the 10th Five-Year Plan are to raise the effectiveness of socialist competition by every means, support and disseminate progressive know-how and forms and methods of work that promote an increase in labor productivity, and consistently implement economy measures.

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#### Organizational Approaches

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 9, 1979 pp 3-5

[Article by I. A. Ganichev, deputy chairman of USSR Gosstroy: "Further Improvements in the Organization of Construction in Building Large Industrial Complexes and Projects"]

[Text] Among the key challenges pointed out by the document "Basic Directions of Development of the USSR National Economy for 1976-1980" and the 29 July 1978 decree of the CPSU Central Committee and USSR Council of Ministers is a further improvement in the organization and management of construction production, optimization of technological processes in building industrial buildings and structures, and raising the level of technical organization and engineering preparation.

Improving the organization of construction is a multifaceted problem whose solution will depend on carrying out a broad range of activities, including economic planning and social measures, to insure the possibility of planned development and smooth performance of construction and installation work and achieving good technical-economic indexes on this basis, plus making fuller use of all the reserves and advantages inherent in the very system of a planned socialist economy.

At the same time, a marked decrease in growth of labor productivity, a significant increase in the volume of incomplete production, and violations of deadlines for construction of industrial enterprises have been observed recently. These things are primarily the result of the quite low organizational-technical level of production, dispersion of labor, material-technical, and financial resources over numerous projects underway at the same time, inadequate technological grounds in design decisions, and failure to deliver building materials, construction components, and equipment in full lots on time.

The level of preparation for construction is extremely low at many sites. Plans of construction organization and comprehensive, consolidated critical path schedules have not yet become mandatory documents for all participants in construction.

The practice which has become established at many construction sites, where clients do not develop and ratify full sets of technical documents on time, in particular the contract design with plan of construction organization which is ratified in the established manner, sharply reduces the level of construction organization at construction sites, virtually precluding the possibility of full preparatory work before construction begins. For example, the oxygen convertor shop at the Cherpovets Metallurgical Plant of the USSR Ministry of Ferrous Metallurgy, the Kharkov Tractor Plant (reconstruction) of the Ministry of Agricultural Machine Building, and various others were under construction for long periods of time without plans of construction organization.

Raising the scientific level of planning is a key means of introducing scientific-technical progress in practical construction organization.

The lack of continuous long-term, including two-year, plans and the instability of yearly plans naturally cause construction organizations additional difficulties because of delays with the development of organizational and technological documents, timely supply of labor and material-technical resources to construction sites, and scientifically substantiated engineering preparations for construction.



With the development of the two decrees, the CPSU Central Committee decree on further improving the economic mechanism and the tasks of party and state bodies and the decree of the CPSU Central Committee and USSR Council of Ministers on improving planning and strengthening the impact of the economic mechanism on raising production efficiency and work quality, which outline a system of steps aimed at improving planning work and the development of democratic principles in production management and creative initiative among working collectives, the situation in construction should change sharply.

An important job for USSR Gosstroy and its scientific research institutes, for the ministries and departments, and the managers of construction organizations is insuring broad practical introduction of the most effective forms and methods of organizing industrial and civil-housing construction and carrying out scientific research on improving the organization of construction and construction technology.

TsNIIOMTP [Central Scientific Research Institute of Mechanization Organization and Technical Assistance to Construction] of USSR Gosstroy, in order to carry out this task effectively, has developed the document "Methodological Instructions on Procedures for Studying, Summarizing, and Introducing Progressive Practices in the Organization and Technology of Construction on the Basis of the Methodological Instructions Ratified by the State Committee for Science and Technology and Presidium of the AUCCTU on 11 August 1978."

Several construction ministries have organized demonstration construction projects for the purpose of working out and introducing the most promising and highly efficient forms and methods of construction organization, technology, and mechanization in the construction ministries and departments. In 1979 orders of the ministries and departments identified 23 demonstration construction projects. TsNIIOMTP of USSR Gosstroy has developed the document "Basic Principles of Organization of Demonstration Construction Projects," and is completing work on the document "Methodological Instructions on Setting Up Demonstration Construction Organizations."

One of the important ways to step up the introduction of scientific-technical advances in construction organization and technology is the brigade contract. It promotes a rise in labor productivity, reduction of construction time, and decrease in the prime cost of construction and installation.

The CPSU Central Committee and USSR Council of Ministers attach great importance to broad dissemination of the brigade contract in all economic sectors. The volume of construction and installation work performed by this method in industrial construction should reach 20-30 percent by the end of the 10th Five-Year Plan.

Measures directed to broad dissemination of the brigade contract in civil-housing, rural, and industrial construction have been discussed several times at meetings of the board of directors of USSR Gosstroy.

The "focal" ["uzlovoy"] method of planning, preparation, organization, and management of the construction of complex projects and large industrial complexes, which has been reviewed by the board of directors of the USSR Gosstroy and recommended for practical introduction in construction and planning, deserves fixed attention and broad dissemination.

The essential feature of the focal method is the identification of a start-up complex composed of units that are distinct in design and technological terms. These are the "focuses" for organizing a technologically substantiated amount of work and rapidly achieving the level of technical readiness necessary for autonomous testing and adjustment of particular industrial lines, divisions, and installations.

This method was first developed and introduced at construction sites in the Ukraine under the direction and with direct participation by G. K. Lubenets, Ukrainian SSR minister of construction of heavy industry enterprises. Between 1974 and 1978 organizations of the Ukrainian SSR Ministry of Construction of Heavy Industry Enterprises, the Ukrainian SSR Ministry of Industrial Construction, and the Ukrainian SSR Ministry of Installation and Special Construction Work built the following installations on this basis: the oxygen convertor shop and 3,600 mill at the Azovstal' Plant, blast furnace No 9 at the Krivorozhstal' Plant, ammonia production complexes at the Severodonetsk Azot Production Association, a plant near the port of Odessa, and others.

Large industrial complexes and enterprises were built using the focal method in other regions of the country in 1977-1978 also, in particular the broad-flange mill at the Nizhniy Tagil' Metallurgical Combine, the cold rolling shop at the Chelyabinsk Metallurgical Plant, blast furnace No 6 at the Novo-Lipetsk Metallurgical Plant, facilities at the Achinsk Alumina Combine, the Krasnoyarsk Aluminum Plant, the Kuznetsk Metallurgical Combine, and others. In all 21 installations were built by this method in 1978. At most of them use of the focal method made it possible to beat deadlines for launching capacities by up to six months and achieve a significant economic impact.

For example, according to figures from the ministries, the scheduled time for launching the first phase of the Khartsyzsk Pipe Plant was shortened by three months with an economic impact of 8.3 million rubles. At the Avdeyev Coke Chemical Plant the corresponding figures for coke battery No 7 with a capacity of 1 million tons of coke were one month and 5.2 million rubles, while for battery No 8 the benefit



was three months and 2.4 million rubles. For the 3,600 mill at the Azovstal' Plant launching time was beaten by two months with a savings of 20.9 million rubles, while blast furnace No 1 at the Kommunarok Metallurgical Plant with a volume of 3,000 cubic meters was completed 1.5 months ahead of time with a savings of 90,000 rubles. At the Khabarovsk Aluminum Component Plant with a capacity of 16,000 tons of components a year the savings was 1.5 million rubles, while at the Khabarovsk Broiler Factory with a capacity of 10.5 million chicks a year they cut 17 months from the schedule and saved 860,000 rubles.

The sources of the efficiency of this method lie in guaranteeing rational concentration and use of material-technical and labor resources within the complex, the possibility of combining jobs for the complex by organizing parallel flows, precise coordination of work within each focus and for the complex as a whole, and establishment of a reliable autonomous system to plan construction and installation work, supply resources, and provide operational control and monitoring of construction progress.

In 1979 the focal method is being used at 14 new sites. Seven of them belong to the USSR Ministry of Construction of Heavy Industry Enterprises, including the Dneprodzerzhinsk oxygen converter shop, coke battery No 1 at the Zaporozh'ye Coke Chemical Plant, the 3,000 mill at the Zhdanov Metallurgical Plant imeni Il'ich, and Asbestos Concentrating Factory No 7 in the city of Asbest. The USSR Ministry of Industrial Construction has six of the projects, including the plant at the Port of Odessa and the ammonia production facility at the Cherkassy Azot Production Association. The USSR Ministry of Construction has the other project.

This method is being introduced most successfully at projects of the USSR Ministry of Construction of Heavy Industry Enterprises, which has summarized the experience gained in building a series of large industrial complexes, written a list of new projects for the 11th Five-Year Plan using this method, and developed and published methodological instructions.

The role of the Dnepr' Promstroyproyekt [State Planning Institute for General Construction and Sanitary Engineering Planning of Industrial Enterprises] in developing and implementing the method has been important. This institute, with the Ukrainian Ministry of Construction of Heavy Industry Enterprises, the Kiev Construction Engineering Institute, TsNIIOMTP, and the Scientific Research Institute of Construction Economics, has now basically completed development of a corresponding manual which includes a section on determining the economic efficiency from application of this method.

According to figures from the ministries and departments, they are going to introduce the focal method at more than 100 complex projects and large industrial complexes in the 11th Five-Year Plan.

In general, however, introduction of this progressive method is going slowly at the construction ministries. The USSR Ministry of Construction and USSR Ministry of Power and Electrification are particularly behind in this respect.

To broaden the practical introduction of this method in construction USSR Gosstroy adopted a special decree which envisions, specifically: summarization of accumulated experience with application of the focal method, conducting seminars for managers and specialists working on questions of further introduction and refinement of this method, and development of necessary normative and methodological documents.

It would appear that the statements by participants at the seminar meeting will deal in more detail with questions of continued introduction of the focal method in practical construction at large industrial complexes and projects, while the managers of ministries, departments and construction organizations, after exchanging work experience, will make valuable suggestions on further improvements in the organization of construction.

In this we must not overlook the important role played by Orgtekhstroy trusts and institutes in improving the organization of construction technology and technical-organizational and engineering preparations for construction and introducing progressive forms and methods of construction organization. These trusts and institutes have about 50,000 qualified specialists who work as organizers of construction.

In March of this year the board of directors of USSR Gosstroy reviewed the question of the working experience of the Orgtekhstroy Trust of the Main Administration for Construction in Novosibirsk. The board confirmed again that when their work is correctly oriented and organized the Orgtekhstroy organizations can make important contributions to improving technical-organizational preparation for construction and thereby raising the technical-economic indexes of the work of construction organizations.

Unfortunately, the ministries and departments are not making full use of this important reserve for improving the organization of production. A significant number of qualified specialists, construction organizers, are not used directly in their specialization but rather are assigned to other work unrelated to construction organization. Engineering preparation for construction today constitutes 10-11 percent of the total work volume of the Orgtekhstroy organizations.

We must see that all construction projects without exception are provided with plans for construction at least two months before work begins and that construction is carried out in full conformity with these plans.

The introduction of accumulated progressive experience with planning, preparation, organization, and management of the construction of complex projects and large industrial complexes using the focal and other effective techniques will help successfully meet the challenges posed by the 25th CPSU Congress with respect to insuring timely introduction of crucial production capacities and installations.

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## CONSTRUCTION

### PLAN FULFILLMENT, FUTURE TASKS REFLECTED

#### Housing Construction Shortfall

Moscow STROITEL'NAYA GAZETA in Russian 30 Jan 80 p 1

[Article: "Put the Reserves Into Operation"]

[Text] During the fourth year of the five-year plan the available housing of the country increased by 102.5 million m<sup>2</sup>. Many contracting organizations managed the annual assignments on the placement of housing into operation. Among them are the Ministry of Construction of Heavy Industry Enterprises of the Ukraine, the ministries of construction of Estonia and Latvia, the ministries of rural construction of Armenia, Georgia, Belorussia, Kazakhstan, the RSFSR and Uzbekistan, the Main Administration for Construction in Vladivostok, the Main Administration for Construction in Murmansk and Chitapromstroy.

But then the results of the work of the all-union ministries as a whole were unsatisfactory. The Ministry of Construction of Heavy Industry Enterprises fulfilled the 1979 plan by 94.7 percent, the Ministry of Industrial Construction--88.9 percent, the Ministry of Construction--90.3 percent, the Ministry of Rural Construction--96.7 percent. In all they failed to provide new settlers with more than 4 million m<sup>2</sup> of housing.

The causes of the upsetting of the placement of housing into operation have been analyzed in the quarterly surveys of STROITEL'NAYA GAZETA. Let us briefly remind the readers about them. The plan aimed the contracting collectives toward the fulfillment in January-June of only slightly more than a third of the program of the year. But they were not able to manage even such reduced assignments. For the USSR Ministry of Rural Construction alone during the first quarter the figure of 115 was in the column of the percentage of fulfillment, in the second quarter there was the figure of 101. The imbalance of the plans of contracting operations with the material and technical resources being allocated and the capacities of the construction organizations was conducive to improper planning.

The results of 1979 once again demonstrated the effectiveness of the Orel "continuous planning method" and the contracts of cooperation of the participants in the development of cities. A purposeful urban development policy (long-range planning, the creation of a two-year reserve of planning documents, the outstripping development of engineering systems) enabled the builders to fulfill their obligations honorably and to put the projects into operation in approximately equal ratios.

The letters arriving at the editorial board attest that in a number of oblasts the city soviet executive committees have taken a position of principle: they do not accept houses with unfinished operations. That is how they acted in Yaroslavl, Groznyy, Rostov-na-Donu, Kalinin and Saransk.

The first quarter of the final year of the five-year plan is under way. Many construction organizations have assumed the obligations not only to fulfill, but also to exceed the program of this year. The union and republic ministries should create all the conditions for the successful work of the collectives subordinate to them.

#### Production Projects

Moscow STROITEL'NAYA GAZETA in Russian 23 Jan 80 p 2

[Article by V. Avtonomov: "The Plan of Placement Into Operation Is the Law"]

[Text] Last year the collectives of the subdivisions of the ministry, Minister G. A. Karavayev said at the joint meeting of the Collegium of the USSR Ministry of Construction and the Presidium of the Central Committee of the trade union, put into operation about 400 production capacities and projects, including 287 of the nomenclature of the state plan. More than 5 billion rubles of contracting work were performed.

However, the USSR Ministry of Construction did not fulfill the annual plan of construction and installation work, 180 production capacities, including 82 of the nomenclature of the state plan, were not put into operation. The deadline of the placement of the most important projects into operation was violated by the Pskov, Mari, Smolensk, Novgorod and Tomsk territorial construction administrations, the Main Administration for Construction in Vladivostok and the Main Administration for Construction in the Regions of the Upper Volga, the construction ministries of the Tadzhik, Turkmen and Lithuanian republics.

It is especially disturbing that a number of organizations of the ministry did not ensure the placement into operation of production capacities which are being built using sets of imported equipment, as well as on the basis of compensatory agreements. In the former case out of 31 capacities only 20 were put into operation, in the latter 3 out of 9.

Some managers of construction organizations still frequently cite the lack of manpower. Meanwhile at many main administrations, particularly the Main



Administration for Construction in the Regions of the Upper Volga, the Main Administration for Construction in Ivanovo, the Main Administration for Construction in the Altay Region and the Main Administration for Construction in Novosibirsk, they are devoting too little attention to questions of the organization of construction work, the quality of the plans of performance of work, the increase of the level of mechanization and the fulfillment of the plans on the scientific organization of labor and new equipment. As a result in these subdivisions not only are the assignments on the increase of labor productivity not being fulfilled, but its level even decreased as compared with the actually achieved labor productivity during the preceding year. The use of manual labor is especially great in the ministries of construction of the Turkmen and Lithuanian SSR's, in the Main Administration for Construction in Novosibirsk, the Main Administration for Volga-Vyatka Construction and the Moldavian SSR Ministry of Construction.

During the final year of the five-year plan the collectives of the subdivisions of the ministry should put into operation 725 production capacities and projects, including 277 of the nomenclature of the state plan. No changes will now be allowed in the program of placement into operation. The principle "Everything that is planned into operation!" should become the law. The priority task of the construction organizations is to put into operation in the very near future the production capacities and projects which were carried over from last year. It is necessary from the first days of the year to work smoothly, to launch socialist competition extensively for a worthy greeting of the 110th anniversary of the birth of V. I. Lenin. This will make it possible to complete the 10th Five-Year Plan successfully.

The Collegium of the USSR Ministry of Construction and the Presidium of the Central Committee of the trade union approved the socialist obligations, which were assumed by the collectives of construction organizations, enterprises and transportation managements, on the early placement of production capacities and projects into operation.

#### Socialist Obligations

Moscow MONTAZHNIYYE I SPETSIAL'NIYYE RABOTY V STROITEL'STVE in Russian No 3, Mar 80 pp 2-3

[Article: "The Socialist Obligations of the Collectives of Construction and Installation, Planning, Design and Scientific Research Organizations and Industrial Enterprises of the USSR Ministry of Installation and Special Construction Work for 1980"]

[Text] Inspired by the decisions of the November (1979) CPSU Central Committee Plenum and guided by the theses and conclusions contained in the speech of General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev at the Plenum, the collectives of the organizations and enterprises of the ministry assume for 1980 the following socialist obligations.



1. On the occasion of the 110th anniversary of the birth of V. I. Lenin:  
to fulfill the four-month plan of contracting work four days ahead of time;

to perform the installation and special construction work, which ensures  
the placement into operation by 22 April of the capacities:

for the production of 361,000 tons of concentrate a year at the Ingulets  
Mining and Concentration Combine;

for the production of sulfuric acid at the Dzhambul Superphosphate Plant;

for the production of sulfuric acid at the Gomel' Chemical Plant;

of the editorial and publishing building of PRAVDA;

of a 600-room hotel of the International Trade Center in Moscow;

of a shop of the cold rolling of carbon steels with a capacity of 1 million  
tons of cold rolled products at the Novolipetsk Metallurgical Plant (turn  
over for start-up and adjustment)--by 25 March;

a capacity for the production of 4 million tons of pellets a year at the  
Severnny Mining and Concentration Combine (turn over for start-up and ad-  
justment)--by 28 March.

2. On the occasion of the 3d anniversary of the new USSR Constitution and  
the 63d anniversary of Great October to perform installation and special  
construction work which ensures the placement into operation of capacities:

for the mining of 3 million tons of nepheline ore at the Tsentral'nyy Mine  
in the Apatit Production Association--by 7 November;

for the production of 1.7 million tons of iron ore concentrate at the Lebe-  
din Mining and Concentration Combine--by 7 November;

for the production of ferrosilicon at the Yermak Ferroalloy Plant--by  
20 October;

the KAR-30 air distribution block at the Cherepovets Metallurgical Plant--  
by 25 September;

for the production of 10 forge and press machines at the Voronezh Plant of  
the KPO imeni M. I. Kalinin--by 7 November;

for the production of 37.8 million m<sup>2</sup> of nonwoven materials at the factory  
in Syktyvkar--by 25 September;

for the production of 500,000 meat poultry at the poultry factory in  
Yangiyul'--by 30 August;

to complete the basic construction and installation work on the complex of the oxygen converter shop and to obtain the first converter steel at the Cherepovets Metallurgical Plant--by 25 June;

3. To ensure in 1980 the fulfillment of installation and special construction work on the early placement into operation of the following projects, complexes and capacities:

the capacity for the mining of 2.0 million tons of apatite-nepheline ore and the production of 300,000 tons of apatite concentrate at the Apatit Production Association--by 26 December;

the capacity for the mining of 2.1 million tons of iron ore and the production of 800,000 tons of iron ore concentrate at the Mikhaylovsk Mining and Concentration Combine--by 29 December;

the capacity for the production of 3 million tons of pellets at the Second Start-Up Complex of Pelletizing Factory No 2 of the Dneprovskiy Mining and Concentration Combine--by 15 December;

the capacity for the production of 500,000 tons of iron ore concentrate at the Yuzhnyy Mining and Concentration Combine--by 20 December;

the KAR-30 air distribution block at the Magnitogorsk Metallurgical Combine--by 20 December;

the capacity for the production of sulfuric acid at the Konstantinovskiy Chemical Plant--by 29 December;

the capacity for the production of sulfuric acid at the Irtyshsk Polymetal Combine (first section)--by 20 December;

the capacity for the production of 5,000 tons of molded and nonmolded industrial rubber items at the Sumy Plant of Industrial Rubber Items--by 25 December;

the capacity for the production of trucks at the Kremenchug Motor Vehicle Plant--by 25 December;

the capacity for the production of pipeline fittings at the Zaporozh'ye Fittings Plant--by 10 December;

computer equipment and spare parts for it at the Severodonetsk Instrument Making Plant--by 29 December;

the capacity for the production of products worth 900,000 rubles at the Odessa Precision Machine Tool Plant--by 20 December;

45,000 loom places at the Tiraspol' Cotton Combine--by 15 December;

800 spinning machines at the Namangan Silk Combine--by 1 December;

the capacity for the production of 1,050 tons of flax fiber and 5,390 tons of flax straw at the Krupki Flax Plant--by 20 December;

the capacity for the processing of 100 tons of milk per shift at the Murmansk City Dairy--by 29 December;

the capacity for the production per shift of 10 tons of whole milk products, 2.9 tons of cheese and a refrigerator for the simultaneous storage of 150 tons at the Lyuban' Meat and Cheese Plant--by 1 December.

The collectives of the organizations and enterprises of the USSR Ministry of Installation and Special Construction Work undertake jointly with the collectives of the organizations of the general contracting construction ministries and clients to ensure the placement into operation of other capacities and projects, which are stipulated in the jointly assumed socialist obligations.

4. To fulfill the annual plan of contracting work by 25 December 1980, and the plan on the amount of sold products of industrial enterprises by 30 December 1980.

5. On the basis of the introduction in construction of the achievements of science and technology, the increase of the technical level and the improvement of the organization of production and labor and the extensive introduction of advanced know-how to exceed by 0.05 percent the assignment set for 1980 on the increase of labor productivity.

6. By mobilizing internal economic reserves and observing a strict policy of economy in using manpower, material and financial resources to exceed the plan of the profit on contracting activity by 10 million rubles.

7. By means of the economical consumption, the careful handling and rational use of material, raw materials and electric power, the use of new effective materials, the improvement of designs and the introduction of advanced technological processes to save during the year in construction and industry: 50,000 tons of rolled metal, 100 million kWh of electric power and 11,500 tons of conventional fuel.

8. For the purposes of ensuring the further increase of production efficiency, the shortening of the duration of construction and the increase of the quality of the performance of work in 1980:

to introduce scientific research work in production with a total annual economic efficiency of 50 million rubles;

to ensure the receipt of the calculated annual saving from the use of rationalization proposals and inventions in the amount of 160 million rubles;

to increase the proportion of the projects and jobs turned over with a rating of "excellent" by 10 percent as compared with 1979;

to submit for certification for the State Seal of Quality in excess of the set plan six items, including the UONI-13/55 electrode of the Ramenskoye Machine Plant;

to manufacture ahead of time, by 7 November, a special caterpillar-tracked installation crane with a lifting capacity of 100 tons, to draft the blueprints of a crane with a lifting capacity of 250 tons, to assimilate 1/ new type sizes of parts of pipelines;

to manufacture ahead of time, by 25 December, at the plants of the All-Union Soyuzspetslegkonstruktziya Association 1.3 million  $m^2$  of light-weight metal structural components for delivery in units;

to develop, produce and test a pilot batch and to prepare for series production new components of built-in facilities of the control centers of automation systems for enterprises of various sectors of industry;

to assimilate at the Molodechno Plant of the All-Union Soyuzspetslegkonstruktziya Association the output of four new type sizes of cold bent welded sections instead of the three stipulated by the plan;

to exceed by 5 percent the assignment on the volume of the introduction of conveyor assembly and large-block installation of the components of the roofs of industrial buildings;

to put into operation ahead of time, by 20 September, five computers of series YeS;

to introduce the conveyor method of the assembly and installation of the trestles of pipelines at the construction site of the second section of the Orenburg Helium Plant;

to assimilate at the plants of the Main Administration for the Installation of Electrical Equipment of Electric Power Plants and Substations the output of 10 new items, including prefabricated general-purpose electrical components;

to introduce in production 65,000  $m^2$  of flexible nonmetallic air ducts made from fiber glass fabric;

to introduce the chemical protection of equipment and gas conduits by liquid rubber mixtures and self-curing latex emulsions in the amount of 52,000  $m^2$ ;

to produce and introduce 200,000  $m^3$  of individual insulating components of all types;

to exceed by 5 percent the set assignment on the production of aluminum labor safety equipment and installation slings;

to produce in excess of the plan 200 general buildings of the container type.

9. To expand the use of the brigade contract in construction. To increase the proportion of subcontracting work performed by the brigade contract method to 35 percent in industrial construction and to 70 percent in housing and municipal construction.

10. For the purposes of creating a permanent skilled labor force to perform further work on the strengthening of the educational base, the expansion and improvement of the training of skilled workers, the improvement of their housing and living conditions, medical service and public dining. To ensure the early placement into operation of apartment houses for the workers of the organizations and enterprises of the ministry with a total floor space of 424,000 m<sup>2</sup>, as well as children's preschool institutions to accommodate 1,620. To ensure the extensive enrollment of workers in schools of communist labor, general educational and evening schools of young workers, who do not have a secondary education, to promote the development of tutorship. To increase the skills of 15,500 workers in excess of the established plan for 1980.

11. By the improvement of the organization and technology of production, the introduction of advanced protective means and equipment, the tightening up of labor and production discipline to achieve the further improvement of the working conditions of the workers and the reduction of the level of production injuries.

The workers, engineers, technicians and employees of the organizations and enterprises of the USSR Ministry of Installation and Special Construction Work assure the CPSU Central Committee and General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev that they will develop socialist competition more extensively for the implementation of the decisions of the 25th CPSU Congress and the successful fulfillment of the 1980 national economic plan and the assignments of the 10th Five-Year Plan and will greet the 110th anniversary of the birth of V. I. Lenin with new labor achievements.

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## CONSTRUCTION

### PROBLEMS IN CONSTRUCTION PLANS, MECHANIZATION DETAILED

#### Plan Delays

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 3 Feb 80 p 2

[Article by Yu. Rakhmanov, USSR Minpromstroy Main Planning-Economics Administration: "Reconstruction Begins Today"]

[Text] The last day of the current year will be the last day for the planning, financing, and organizational methods now in effect for capital construction. Its replacement will be a more advanced system of economic management procedures envisaged in the USSR CPSU Central Committee and USSR Council of Ministers Decree, "Improvement of Planning and Strengthening the Effect of the Economic Mechanism In Increasing Production Efficiency and Quality of Operations".

In accordance with this document, one of the primary indicators of production operations in construction organizations, commencing with 1981, will become the plan for commodity construction production. Considerable details have been published in SOTSIALISTICHESKAYA INDUSTRIYA recently. However, one important aspect, in my view, was omitted. It should be particularly emphasized that the new system must finally be organized in the bases of the old and serve for a period of time as an unofficial control tool at all management levels.

In the USSR Minpromstroy, for example, in accordance with the program plan ratified by the collegium, a series of group seminars are being conducted. Their goal is to examine practical questions associated with accomplishing the degree. Envisaged is the development of objective methods or approaches for improving planning and economic management methods in construction, and use of finance-credit levers in improving the efficiency of construction production, i.e. to acquaint in detail the majority of economic practical workers with the know-how of the Belorussian Minpromstroy, where in 1976 the new method was in effect not concurrently with, but supplanting the generally accepted method.

The Belorussian experiment, widely publicized, graphically demonstrated that the introduction of the construction commodity production indicator

facilitates concentrating resources at construction projects slated for completion during the current year. During this time the average duration of structure construction in the republic dropped by 16 percent.

It should be noted that the union ministry, at its own initiative, is developing and ratifying through its subelements internal, so to speak, plans for construction commodity production. These plans have exerted noticeable effect upon results of economic operations. Thus, in the past few years, the level of production plan fulfillment at the most important current year projects continually outstrips by 3-5 percent the ministry-wide indicator for accomplishment of plan tasks.

As is obvious from the decree, the plan for the Eleventh Five-Year Plan must be developed with an allowance for maximum use of production capacities and construction organization resources. Such an approach requires a thorough preliminary analysis of conditions and capabilities of each trust, combine, and association. Assistance in this matter must include the classification of all contractor subelements and industrial enterprises.

It would seem superfluous to note that the new management mechanism to a great extent is based upon principles proven during wide-reaching economic experiments conducted in recent years in contractor organizations of a number of construction ministries. This is the widely publicized Belorussian experiment, planning of labor productivity, the Orlov continuous method' (nepreryvka), and many others. It is clear that the accomplishment of the tasks envisaged by the decree will require an even more active implementation of advanced approaches and methods. The union ministry is working in this direction.

However, numerous difficulties lie before the establishment of a new management mechanism, the surmounting of which will require far more than local economic training of specialists.

With the next year, the responsibility of the contractor for the timely conclusion of the construction will increase considerably. The source of financing, and therefore the existence of the contractor organization, will become the bank credit, which costs less the quicker the project is turned over. Additionally, each day the contractor is late with turnover, his profit automatically decreases, funds required for the needs of the contractor organization.

However, the contractor is far from being at fault every time in the case of project turnover. The trusts of the BSSR Minpromstroy, for example, frequently pay with profits due to the fact that the turnover of the project and the delivery of its equipment are planned for the same time, at the end of the year as a rule. Overall, many such planning errors occur through out our ministry annually. This list frequently includes important national economic projects. Just in the last year the start-up of 20 major capacities were delayed, including isoprene production in Novokuybyshev, of polystyrene in Omsk, of carbamide resins in Shebekino

and others. The current year envisages the majority of site introductions in the same fourth quarter. This is again primarily due to the suppliers: they have projected manufacturing the equipment once again at year's end.

It would appear that it is not too late to rectify the situation in a number of cases. The year has just started. Where there is the slightest possibility, delivery dates have to be advanced.

The chronic imbalance between capital construction plans and site material-technical support plans is cause for serious concern. The contractors at times charge careless attitudes with respect to cement, rolled metal products, and pipe and other materials. There is no doubt, this does occur. It happens, even that managers of territorial main administrations complain of material shortages, and after an investigation, receive penalty assessments due to above norm reserve supplies.

However, conscientious managers also justifiably complain of shortages. Take, for example, the "Vinnitapromstroy" combine. Here, as it is sometimes said, every nail is accounted for. For several years now, a system of planning, re-supply, and control of material-technical resources has been operating directly for the reinforced brigade. This valuable experiment is being duplicated by an ever increasing number of our ministry's organizations. And do the Vinnitsa workers live with abundance? Not extremely. Eighty percent of their requirements for cement is satisfied, sixty percent of rolled metal product needs, and even less for lumber. This situation forces a disruption of the technological sequence of work operations, retards increasing labor productivity, and in the final analysis, makes construction more expensive.

The CPSU CC and USSR Council of Ministers decree relating to economic problems outlined a fundamental solution for this problem—to conclude in 1981 the transition of all construction projects in the national economic plan to comprehensive material supply via the territorial supply organizations of the USSR Gosstab. It will be implemented by orders of the construction-installation organizations in accordance with demands established by plans and estimates.

However, the practical resolution of this question is being delayed by the necessity for establishing a normative base for defining material resource requirements and to develop appropriate planning sections which are to be constructed in the first year of the new five-year plan. We know that the USSR Gostroy and its institutes have for some time been conducting such work, and that in a number of areas, specifically if Saratov, such an experimental system is in operation. A firm conviction would be welcome that the transition from experiment to wide-spread practice would come to pass this summer, when the transmittal of technical documentation for the future year plan commences, inasmuch as reliable supply is one of the most important elements in the new management mechanism.

A final comment. Everything said has direct application to one of the most acute of problems--the methodological materials which are to facilitate

the transition of the economic services to new "rails". I am not particularly comfortable discussing a shortage of such materials, inasmuch as the system itself, i.e., of commodity planning in capital construction to a significant extent was born and tested by experiment in our ministry. Thus this would seem some sort of affront to oneself. Even to a greater degree, it would be so to the scientists-economists and personnel of the planning organizations.

The fact remains. Currently, more and more trusts, main administrations, and entire ministries at the republican level are accepting the new system. However, a comprehensive, encompassing document, unifying all methodological directives for planning and accounting for construction commodity production, and for organizing relations between allied organizations under novel conditions does not exist to this day.

True, there do exist several versions of planning methodology prepared by employees of the MISI-attached NIIOS of the USSR Gosstroy NII for Construction Economics and of our ministry. Each, however, requires completion and testing in the crucible of the combined commission of experts from the Gosplan and Gosstroy. This work must not be dragged out.

#### Mechanization Problems

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 21 Feb 80 p 2

[Article by P. Moiseyev, Chief, USSR Gosstroy Department of Construction Mechanization: "Mechanization of Construction Manual Labor Operations"]

[Text] If in earth moving, concrete, and installation operations in the field of construction approached 100 percent, in other words, the lion's share being performed by machines, then the situation in the post-installation or erection area is not as propitious. In just the USSR Mintyazhstroy, Ministroy, and RSFSR Minzhilgrazhdanstroy (Civil Construction) approximately 100,000 workers are employed in building finishing operations where no machinery at all is used.

What is the underlying reason for this? The authors of materials published on this subject in SOTSIALISTICHESKAYA INDUSTRIYA have noted justifiably: construction workers are very poorly provided with physical labor mechanization equipment, particularly with machine tools and finishing machines. Their requirements for such equipment are now being satisfied on an average of 30 percent of the time, including tool requirements--approximately 60 percent, and for finishing machines, 40 to 50 percent.

They are manufactured primarily by enterprises of Ministroydormash, in the main by plants of the "Soyuzstroyinstrument" VPO. True, in recent years, builders who have experienced continuous shortages of small scale machinery are setting up their own production. For example, in the USSR Minenergo and USSR Ministroy, such machinery, valued at tens of millions of



rubles. This, unequivocally, is a great help, but overall the problem remains very acute. It is absolutely obvious: to radically change the situation, it is necessary to increase the output of small scale equipment, primarily by Minstroydormash plants. In the past 12-13 years, several directive decisions have been adopted regarding this problem. However, tasks both for the production of machine equipment by existing enterprises and for increasing the capacities for augmented production of tools and finishing machinery are being disrupted.

The list of those in arrears during the past year include 6 enterprises of every 9 producing mechanized tools. Above all is the Yaroslavl' "Krasnyy Mayak" (director V. Masayev), owing more than 40,000 electric vibrators; the Konakovo Mechanized Tool Plant (director A. Cheremushkin), from which customers failed to receive 34,500 electrical and pneumatic tool units; the Odessa Construction-Finishing Machine Plant (director G. Lobashov) which manufactured 8,000 fewer vibrators and pneumatic punch [drift] than the plan projected.

The production of construction-finishing machinery is also lagging. During the past year, of the four "Soyuzstroyinstrument" enterprises producing them, only the Vil'nyus' Construction-Finishing Machine Production Association fulfilled the plan. The remaining three—the Lebedyan' Plant, (director V. Grigor'yev), the Nazran' "Elektroinstrument" (director M. Burabov) and the already noted Odessa plant were short 8,000 plastering and finishing units, chalk and paint grinders, paint mixers, and parquet grinding-polishing machines and other machines much needed now by every construction project.

How to explain such a situation? Non-fulfillment of plans by enterprises of the "Soyuzstroyinstrument"—this consequence of primarily internal breakdowns in organization permitted by the management of the association (chief V. Popov). For example, take the Yaroslavl' "Krasnyy Mayak". Here the organization of production is not that high, and working conditions are poor. The plant works sporadically over long periods. Only 10-12 percent of the production employees are unified under a single job authorization. As a rule, more than 50 percent of total volume of production is accomplished during the last ten-day period.

In several plants, for example the Lebedyan', item labor intensity is high, and a great deal of manual labor is used in production. It must also be emphasized that a number of VPO enterprises are located in old, crowded, and unsuitable structures. The ministry has failed to undertake timely programs to remodel them.

In the interest of fairness, it must be said that the tasks of the "Soyuzstroyinstrument" enterprises are extremely complicated by the chronic shortage of certain components. These are caused by a number of sectors, but more complaints than any other are directed toward the electric machine builders. Small switches, for example, are required literally by every plant producing electric tools. Minelektrotekhprom, however, delivers them



in insufficient quantities. In 1979, with a job calling for the manufacture of 1,280,000 switches, Minstroydormash plants delivered slightly over 750,000. This year, in lieu of the 1,500,000, the electric machine builders are promising just over 500,000.

Moreover, alluding to a shortage of capacities, this ministry is totally refusing certain of its items to "Soyuzstroyinstrument". In order to somehow solve this problem, the VPO must organize their production in enterprises currently unsuited for that.

Due to the fact that Minelektrotekhprom is not setting up the production of special electric motors for small scale mechanization, a number of highly-efficient equipment models are not being manufactured. To this time, despite the great need for them, machines designed for the welding of linoleum are not being produced.

A particularly sore problem is current transformers for construction sites. Without these, certain electrical tools cannot be employed. At best, the requirements for transformers are being satisfied at a 20 percent level. As a result, many machines are not being used or lie in warehouses. I emphasize: what is being discussed is not a matter of hundreds of machines, but of tens of thousands! The responsibility for such a situation is primarily with those same electric machine builders.

This is, so to speak, a misfortune of existing production. However the problem is not only there. The capacities of Minstroydormash are generally inadequate to fully satisfy the demands for low-scale mechanization. This is why a timely projection was included in the current five-year plan to build three new plants: the Beloretsk plant for producing mechanized tools, the Ingorrudnensk Construction-Finishing Machinery Plant, and the Volkovsk plant for manufacturing roofing and finishing machines. In addition, almost a ten-fold increase in capacity will be achieved through a radical remodeling of the Kostopol' "Sstroyinstrument" plant. Thus, if everything proceeds as planned, in the near future, builders will be receiving additional hundreds of thousands of various equipment units. They will have been liberated from screwdrivers, manual paint sprayers, wrenches, putty knives, and other primitive devices.

Through the fault of those same builders, however, not one of the plants will be placed in operation on the established date. The USSR Ministry of Industrial Construction, for example, this year included the Beloretsk project in their plans, at a time when it was scheduled to be placed into operation. After all, just this plant alone was to produce more than 400,000 electrical and pneumatic tool units. Also, in Kostopol', the "Rovnopromstroy" trust of the Ukraine has assimilated only approximately 500,000 rubles of 11,270,000. Judging from everything, customers will hardly be receiving 70,000 finishing machines from this source by the established deadlines, including equipment which they are now totally lacking in their inventory.

In a word, the jobs are disrupted here. Not only is a general increase in tool and finishing machine production delayed, a broad assimilation of efficient new developments is postponed, the series production of which was associated with the opening up of the new construction project plants. This is just one example.

Specialists from the sector institute of Minstroydormash--the VNIISI, in conjunction with the operations personnel developed powerful capacities--units permitting the full mechanization of painting and plastering operations. With the use of one "SO-115" painting station, it is possible to cover up to 1,500 square meters of surface in a shift. Each such unit frees several finishers. But neither the painting station or the "SO-114" is series produced.

This is why it is necessary to concentrate a vast army of people in the construction elements to carry out the growing volumes of finishing, plumbing, electrical installation, and roofing work. At the same time, according to data from the VNIPI-labor and the USSR Gosstroy TSNIIOMTP, the use of ten units of mechanized tools frees one employee and increases labor productivity by 10 percent. It is understandable, what a vast reserve is still available for increasing the performance of construction organizations, for freeing labor resources and for making the work of hundreds of thousands of workers easier.

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## CONSTRUCTION

### PLAN RESULTS FOR CONSTRUCTION, ROAD-BUILDING MACHINES

#### Plan Results

Moscow STROITEL'NIYE I DOROZHNIYE MASHINY in Russian No 3 1980 pp 1-2

[Article: "The Sector's Work in the Fourth Year of the 10th Five-Year Plan"]

[Text] In the past 4 years of the 10th Five-Year Plan our country has moved forward in the development of the national economy, aimed for a further increase in the material and cultural standard of living for the people, and strengthened the defense capabilities of the homeland. As comrade L. I. Brezhnev noted in a speech to the CPSU Central Committee Plenum in November (1979) "...since the beginning of the five-year plan much work has been done to realize the economic and social policies that were developed at the 24th and 25th CPSU Congresses. The achievements are apparent and they are many. In them we see a good basis for solving the national economy problems of 1980 and for making positive progress on the road to building the material-technological base of communism."

The economic development of socialism rests on powerful production and scientific-technological potential. During the past 4 years of the 10th Five-Year Plan, in comparison with the corresponding period of the 9th Five-Year Plan, an additional national profit of 323 billion rubles and an additional 600 billion rubles of industrial output were obtained and gross production for agriculture grew by more than 400 billion rubles.

Workers in the construction, road and municipal machine building sector worked with inspiration to transform the decisions of the 25th CPSU Congress into reality, as did all Soviet people.

The Ministry of Construction, Roads and Municipal Machine Building fulfilled 100.5 percent of the plan for 1979 in volume of actual output and in comparison with 1978 growth in the volume of actual output comprised 103.8 percent. An output of 20.3 million rubles above the annual plan was realized. The plan for goods intended for cultural, everyday

and household use was fulfilled by 100.3 percent. In all 300,000 rubles of such goods were produced.

On the whole deliveries of machines, equipment and spare parts for construction organizations, agriculture and export were met.

The plan for the growth of labor productivity was fulfilled 100 percent. Gross commodity production for one industrial-production worker increased in comparison with last year by three percent. In 1979, 90 percent of the total growth in production volume was obtained due to an increase in labor productivity.

During 1979 the ministry paid much attention to the problems of further improving the quality of manufactured products. The relative proportion of high quality products reached 29 percent of the total production volume, i.e., it increased by more than a factor of 2.5 in comparison with 1975--the base year for the 10th Five-Year Plan.

Collectives at a majority of ministry production associations and enterprises successfully completed the goals of the plan for 1979 in production volume, variety of products turned out, labor productivity, profits, new technology, and other indices.

The highest indices in fulfilling the goals of the plan and the socialist obligations for 1979 were attained by the production associations "Avtokran," "Krasnyy Ekskavator," the Sverdlovsk "Pnevmostroymashina," the Mogilev "Strommashina plant imeni the 50th Anniversary of the Great October Revolution, the Kalinin excavator plant, the Odessa "Stroygidravlika," and many others.

As in previous years the Ministry gave much attention to the problems of further improving the construction of manufactured products and to the unprecedented growth of producing more advanced types of machines and equipment that have a great effect on the national economy.

Along with a total increase of 2 percent in the production of excavators, the output of single bucket excavators, which have a hydraulic mechanism and turn 360°, comprised 103 percent compared to the previous year.

For the first time in the USSR a series of efforts to create and begin series production of a standardized range of hydraulic cranes with telescoping boom equipment on a special motor vehicle type chassis with load capacities of 25, 40, 63, and 100 tons were accomplished on the basis of socialist integration and cooperation between PNR [expansion unknown]. In 1979 the output of cranes on a special chassis increased by a factor of 2.4 compared with 1978.

Qualitative changes have occurred in the production of land development technology. Thus, the output of rotor plows and MK-17 canal excavators increased by a factor of 1.5 and brush cutters on T-130 tractors increased by a factor of 1.4.

An increase in the output of LT-157 hauling vehicles was accomplished at logging machine building enterprises. The introduction of each LT-157 vehicle for logging frees 2 to 2.5 workers from labor consuming and dangerous work with a corresponding increase in labor productivity. The output of LP-19 cutting-baling machines has increased, the introduction of which sharply reduces injury and incidences of illness when cutting down trees and completely eliminates manual labor.

In carrying out the decisions of the 25th CPSU Congress relative to the creation of new types of highly productive equipment for the production of cement by the dry method, work was carried out to develop and manufacture this equipment by means of creating technological lines and by using preliminarily decarbonized raw materials.

The transfer to technology which uses preliminarily decarbonized raw materials makes it possible to exploit the advantages in the dry method of producing cement (a reduction in heat consumption by 40 to 50 percent in comparison with the wet method) and at the same time to significantly reduce the mass and dimensions of rotary furnaces which improves their utilization qualities (with a productivity of 3,000 tons per day, a furnace with a diameter of 4.5 x 80 meters is used instead of a furnace 6.4 x 95 meters, and the mass is reduced by 1,400 tons, with a productivity of 5,000 tons per day a furnace 5 x 100 meters is used instead of a furnace 7 x 125 meters with a reduction in mass of 2,000 tons). Reducing the dimensions of a furnace's diameter aids in increasing the durability of the fettling by a factor of two under similar conditions.

Complete technological lines have been created on the basis of utilizing two-stage mills in highly mechanized plants for the production of reinforced concrete components for large panel housing construction with a productivity rate of up to 180,000 square meters of total living space per year. By means of this, labor consumption is reduced in turning out products by 25 percent, the total consumption of metal by 30 percent and capital investments by 10 percent.

The "Krasnyy Oktyabr'" plant in Khar'kov put modernized presses for clay and silica brick into production. The SMK-133 and SM-1085A presses which were turned out by the "Strommashina" plant imeni the 50th Anniversary of the Great October Revolution in Mogilev were awarded the State Seal of Quality.



The stone processing machines which were made in recent years are distinguished by a high level of technology which is not inferior to the level in the best models of foreign firms. The SMR-012A, SMR-018 and SMR-019A received the State Seal of Quality and the standardized series of stone processing machines which were made have no equivalents abroad. In this series of machines the main gears for the cutting tools, the feeder mechanisms, the cable cylinders, the cabs, etc. are standardized.

The technological level of crushers which are turned out at ministry plants was significantly increased and the parameters were improved. The basic series of jawbreakers, conical and hammer crushers produced by the Vyksunskiy crushing-pulverizing equipment plant and the Kemerovo and Kostroma "Strovmashina" plant are completely interchangeable. The productivity of new crushers has increased on the average by 15 percent, wear and tear on the articles that quickly wear out (crushing plates) was reduced by 50 percent and the range of use for crushers has expanded. Automated and mechanized elements that regulate the size of the discharging apertures have been introduced into the structure of the crusher. Due to an increase in reliability for the basic assemblies in the crushers the time between service and maintenance was increased by 40 percent. The new crushers correspond to the technical level in crushers of foreign firms. The SMD-28, SMD-108, SMD-109, SMD-110, SMD-116, SMD-75, SMD-85, SMD-86, and SMD-112 were awarded the State Seal of Quality.

The products list of units among the mobile crusher-sorter machines (PDSU) has been significantly updated. The SMD-26, SMD-27, U-4060-02, SMD-104 and SMD-131, which are among the PDSU's, have been awarded the State Seal of Quality.

Among the total number of machines for the municipal services economy, output is being increased at an unprecedented pace for: highly efficient KO-503 vacuum machines by a factor of 1.8; modern KO-404 trash trucks that load trash mechanically and have a capacity of 8 cubic meters by a factor of 2.5; KO-705A all-purpose sweeper machines by 44 percent; production of vacuum machines on the KamAZ chassis that have a tank capacity of 9.5 cubic meters has been organized.

Production of laundry equipment and spare parts for it was increased by 6.5 percent in 1979 in comparison with 1978. Along with this the production of KP-015 type automatic washing machines, which have a load capacity of 25 kg, was increased by a factor of 4.7.

The products list of mechanized construction tools expanded. Output increased for highly efficient double insulated two-speed electric drilling machines with drilling diameters of 14/9, 23/14, 32/23 mm; vibrationally safe low impact electric nut turning machines with an energy impact of 16 and 63 joules; double insulated electric cutting scissors that can cut a sheet up to 5 mm. The total volume of production for mechanized construction-assembly tools increased by 6.2 percent in 1979 in comparison with 1978.

In order to accelerate development of the natural resources in the northern and northeastern parts of the country following the decisions made by the 25th CPSU Congress and comrade L. I. Brezhnev, General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, related to Siberia and the Far East, the ministry is constantly increasing the output of machines for northern use that operate the most efficiently under low temperature conditions and particularly those that are being utilized for construction of the Baykal-Amur mainline.

As in previous years, the ministry gave much attention to increasing the technical level of production, perfecting the organization of production and labor and improving working conditions at plants in the sector.

Technological outfitting for production increased: 8 shops were completely mechanized, 59 mechanized flow lines and 60 machines with programmed controls were put into operation. The level of mechanization for loading-unloading, transportation and warehousing operations at enterprises and production associations of the ministry comprised 85 percent; the level of mechanization and automation for welding work was 77 percent.

Carrying out the measures in the plan for technological reequipment together with an increase in the technological level of production made it possible to conditionally free more than 12,000 persons among the industrial-production staff.

In 1979 work was continuing to construct, put into operation and develop new production capacities for a number of the ministry's enterprises and structures, the most important of which are the Volzhskiy components and assemblies plant (newly constructed), the Balakovo self-propelled land preparation machines plant (newly constructed), the Tuymazy concrete truck plant, the Uchaly timber machine building plant (newly constructed), the Faleshty machine building plant, the Volkovysk roofing and individual construction machinery plant (newly constructed), the Voronezh excavator plant imeni Comintern (a steel casting complex with the capacity to produce 50,000 tons of steel cast materials in a year), the Mogilev elevator construction plant (2nd phase--27,700 square meters), and the Volzhskiy "Volgotsemash" cement machine building plant (a steel casting complex with the capacity to produce 50,000 tons of steel cast materials per year).

Completing construction and developing production capacities at these plants will make it possible to significantly increase the output of a number of highly efficient types of machines, equipment and tools. This will also aid in increasing the level of assembly and technological specialization in the sector and in the development of preparatory production.

In the past years of the five-year plan work continued to further perfect management in the sector. In particular, experimental plants have transferred to a new system of planning and economic stimulation, work was completed to centralize the function of supplying enterprises that are a part of associations with material-technological requirements and a number of problems in mechanizing the sector's management were solved by using an EVM [electronic computer].

Measures have been accomplished to transfer the work done by new technology in scientific research, structural, structural-design, and technological organizations as well as production and scientific-production associations to the new system of planning, financing and economic stimulation.

During the past years of the 10th Five-Year Plan a significant amount of work was conducted to expand specialization and to develop intra-sector cooperation. The level of item-specialization in 1979 comprised 99.5 percent for bulldozers, 99.3 percent for excavators, 96.6 percent for laundry equipment, 96.5 percent for general purpose ventilators, 95.5 percent for chemical cleaning equipment, and 95.2 percent for reinforced concrete components.

The volume of joint deliveries that require cooperation increased by 33.6 percent in 1979 in comparison with 1975.

Further development of article and component specialization was obtained by means of standardizing assemblies for machines and equipment. The number of items of centrally manufactured articles and components increased by 36 percent and the volume of output increased by 70 million rubles in comparison with 1975.

Proposals were worked out to further perfect the general management system in the Ministry of Construction, Road and Municipal Machine Building. The creation of five new production associations and one scientific production association was specified.

In accordance with the CPSU Central Committee and USSR Soviet of Ministers Decree "Concerning an Improvement in Planning and Increasing the Influence of the Economic Mechanism to Improve Production Efficiency and the Quality of Work," specific measures were worked out by the ministry to perfect planning and management for the sector. In particular, preparatory work is being done to transfer over to evaluating the production-economic activities of associations and enterprises according to net production standards, to develop methods of calculating standard expenditures for wages in rubles of net production by using an EVM, to introduce systems for the organization and payment of labor at ministry enterprises based on the experience of VAZ [the Volga motor vehicle plant], and others. All of this will make it possible to

increase the scientific level of planning and management for the sector and also the efficiency and quality of work.

The collectives in the enterprises and organizations of the Ministry of Construction, Road and Municipal Machine Building are firmly resolved to successfully accomplish the decisions of the 25th CPSU Congress and the November (1979) Plenum of the CPSU Central Committee and to mark 1980, the concluding year of the 10th Five-Year Plan, with new labor triumphs.

The massive socialist competition among the collectives and organizations of the sector to properly greet the 110th anniversary of the birth of V. I. Lenin will guarantee this. Let's turn 1980 into a year of fast pace work in the manner of Lenin, and by means of this create a good basis for a successful start on the 11th Five-Year Plan.

#### Outstanding Plants

Moscow STROITEL'NYYE DOROZHNYYE MASHINY in Russian No 3, 1980 pp 3-5

[Article: "Concluding Year of the 10th Five-Year Plan--A Year of Fast Pace Work in the Manner of Lenin"]

[Text] Workers in the Construction, Road and Municipal Machine Building sector are firmly resolved to mark the concluding year of the 10th Five-Year Plan and the year of active preparations for the 26th CPSU Congress with new labor triumphs. The CPSU Central Committee and USSR Soviet of Ministers Decree "Concerning an Improvement in Planning and Increasing the Influence of the Economic Mechanism to Improve Production Efficiency and the Quality of Work," the decisions of the November (1979) CPSU Central Committee Plenum, and the instructions given by comrade L. I. Brezhnev at this plenum aroused a huge upsurge in creative activity by collectives of enterprises and organizations. Socialist competition was developed at all enterprises to complete the goals of the five-year plan ahead of schedule with the slogans: "Let's turn the concluding year of the 10th Five-Year Plan into a year of fast pace work in the manner of Lenin!" and "It is a personal five-year plan which leads up to the 110th anniversary of V. I. Lenin."

Collectives of the "Avtokran" production association, the Odessa "Stroygidravlika" plant, which received the Order of the Red Banner of Labor, and the Mogilev "Stromashina" plant, which also received the Order of the Red Banner of Labor; a complex communist labor crew for producing casting equipment at the Sverdlovsk "Pnevmostroymashina" production association, which is supervised by N. I. Lepakov, a reliable innovator in the RSFSR and USSR State Prize laureate and N. F. Popov, USSR State Prize laureate and lathe operator in the

Voronezh production association Imeni Comintern which produces excavators came forward as initiators of the socialist competition in the sector for 1980.

The collective of the "Avtokran" association, having come forward as an initiator of socialist competition in 1979, fulfilled its obligations ahead of schedule and turned out 1,156,000 rubles worth of products and 80,000 rubles of goods intended for cultural and everyday use above the established quotas. During the past year the relative proportion of high quality products in the total volume of gross output increased significantly and reached 19.77 percent as against 17.6 percent in the plan. Labor productivity comprised 3.9 percent as against 3.26 percent in the plan. The yield on capital increased by 1.5 percent in comparison with 1978. The coefficient of interchangeability for equipment reached 1.57. Based on the results of the work in 1979 the "Avtokran" association was awarded the temporary Red Banner of the Ministry of Construction, Road and Municipal Machine Building and of the Trade Union Central Committee for workers in heavy machine building.

In 1980 the "Avtokran" association collective resolved to work under the slogan of "Let's turn the concluding year of the five-year plan into a year of fast pace work in the manner of Lenin!" and to overfulfill the annual plan for production volume and actual products turned out by 650,000 rubles. To overfulfill the planned quota for labor productivity for the 4 months leading up to the 110th anniversary of the birth of V. I. Lenin by 15 percent, to turn out 300,000 rubles of products over and above the plan, and to ensure that no less than 211 workers (including 11 crews) in the association fulfill their five-year plan quotas.

To develop and manufacture, together with workers in structural design organizations, an experimental model of a KS-4572 16-ton hydraulic truck crane on a KamAZ-53213 chassis in 1980. To increase the specific proportion of high quality products in the total production volume to 20.8 percent. To completely mechanize 6 production sections, to assemble and put a mechanized flow line and a mechanized warehouse into operation, to bring the level of mechanization for welding work up to 90.1 percent, for gas cutting work to 92.6 percent and for loading and unloading work to 86.5 percent. To increase the yield on capital by 1 percent in comparison with 1979, to economize 75 tons of ferrous metal, 2.5 million kilowatt hours of electricity, 200 tons of conventional fuels, and 5,700 gram calories of thermal energy.

To ensure that all crews, shifts, sections and shops fulfill the plan at a smooth pace throughout the year and to ensure that the obligations related to delivery of products according to the established products list and in accordance with economic agreements are fulfilled by all enterprises in the association.



To fulfill the plan for the social development of the collective: to put 3,800 square meters of living space into use; to provide all children of workers in the association with a place in children's preschool institutions; to set aside accommodations in the holiday home for no less than 1,000 workers in the association; to provide sanatorium treatment for 500 persons and to send 1,400 children to the plant's Young Pioneer Camp.

The collective of the Odessa "Stroygidravlika" plant, which has been awarded the Order of the Red Banner, fulfilled the plan for the four years of the five-year plan by 1 October 1979 and the annual plan by 6 December. In all, 7,949,000 rubles of products were turned out above that specified by the controlling figures of the five-year plan. The plant's collective worked at a smooth pace and ensured the output and delivery of products on the established products list and in accordance with contract agreements. Labor productivity increased by 3.8 percent. The output of high quality products in the total production volume was increased by 9.3 percent. The plan for technical reequipping of the plant was completed on 1 November. The coefficient of labor mechanization was increased to 63.7, basic production work to 83.2 percent and loading-unloading operations to 94 percent. In all, 631,000 kilowatt hours of electric power were economized as well as 377 gram calories of thermal energy and 18 tons of metal; the coefficient of utilization for ferrous metals was increased to 0.86.

Competing under the slogans "Not one laggard nearby!" and "The five-year plan leads up to the 110th anniversary of the birth of V. I. Lenin," 92 workers and 7 crews met the goals for the 10th five-year plan by 1 January 1980.

The Odessa "Stroygidravlika" plant was the winner of the All-Union socialist competition for 1979 and was awarded the temporary Red Banner of the CPSU Central Committee, the USSR Soviet of Ministers, the VTsSPS [All-Union Central Council of Trade Unions] and the VLKSM [Komsomol] Central Committee with this being recorded on the Board of Honor at the USSR VDNKh [Exhibition of USSR National Economic Achievements].

The collective of the Odessa "Stroygidravlika" plant, striving to put its weighty contribution towards increasing the economic might of the country, to fittingly greet the 110th anniversary of the birth of V. I. Lenin and to turn the concluding year of the 10th five-year plan into a year of fast pace work in the manner of Lenin, has taken on great socialist obligations for 1980: to fulfill the annual plan for production volume and actual production by 28 December; to produce 430,000 rubles of hydraulic devices and automated hydraulic articles and 70,000 rubles of goods intended for cultural-everyday use; to augment the increase in labor productivity by 15 percent in comparison with the

plan's quota; to increase the output of high quality goods to 77.6 percent of the total production volume; to complete the plan for the technical reequipping of the plant by 7 November; to ensure the planned increase in production basically by means of increasing labor productivity and economizing materials; to economize 200,000 kilowatt hours of electric power and 15 tons of conventional fuel; to lower labor consumption for basic articles by 2.5 percent; to lower the cost of production by 0.5 percent and to obtain 150,000 rubles in profit above the plan by means of further perfecting production organization and by reducing non-production expenditures.

To succeed in perfectly fulfilling contract obligations: to completely fulfill the annual plan for deliveries for all consumers by 26 December, for export and orders made by the Sayano-Shushenskoye GES 15 days early, and for agriculture 10 days early. To increase the volume of maintenance to 3,000 hydraulic machines per year, to create an exchange pool of hydraulic machines for this and to ensure delivery of them after service within a three day limit. To increase the crew form of organizing labor to include 10 percent more piece workers.

Three shops, 4 sections as well as 16 crews and 430 workers have pledged to fulfill the five-year plan by the 110th anniversary of the birth of Lenin.

For the plant to complete implementation of the control figures of the 10th Five-Year Plan for production volume by the third anniversary of the USSR Constitution (7 October 1980) and to turn out 8.6 million rubles of products above the five-year plan.

To fulfill the plan for capital construction ahead of schedule by 25 December and to obtain growth in the public eating system. To train 140 new workers in the plant's system of production-technological training and to raise the qualifications of 730 people.

The collective of the Mogilev "Strommashina" plant, which was awarded the Order of the Red Banner of Labor, being an initiator of the socialist competition in the sector for 1979, ensured that all socialist obligations and planned goals that were taken on were fulfilled for all technological-economic indices while turning out and delivering products on the established products list at a smooth pace and in accordance with concluded agreements. The plan for production volume for the 4 years of the five-year plan was completed by 26 November 1979 and 2,790,000 rubles of products above the plan were turned out. The release of products by the OTK [Production Control Section] after a single inspection reached 98.5 percent, the growth in labor productivity was increased by 2.3 percent above the plan and the coefficient of interchangeability for metal cutting machines comprised 1.73. The SMT-203 automated line was produced and tested ahead of schedule which produced

a savings of 358,000 rubles in the national economy. A completely mechanized section was put into operation which utilizes seven machines with a ChPU [expansion unknown] and two model A-825M semi-automatic welding machines. The level of mechanized labor for the plant comprised 75 percent. In all, 50 tons of ferrous metal, 816,000 kilowatt hours of electric power, 57 tons of conventional fuel and 40 tons of charged materials were economized. Seven hundred and twenty-six workers are working on unprecedented plan goals. Twelve workers and one crew fulfilled the five-year plan by the beginning of 1980.

The plant's collective was the winner of the All-Union socialist competition for 1979 and was awarded the temporary Red Banner of the CPSU Central Committee, the USSR Soviet of Ministers, the VTsSPS and the VLKSM Central Committee, with this being recorded on the Board of Honor at the USSR VDN.Kh.

The collective of the Mogilev "Strommashina" plant, after thoroughly reviewing its capabilities from all sides, has taken on even greater socialist obligations for 1980. Chief among them are to completely fulfill the five-year plan for production volume by 26 November 1980 and to manufacture 2.8 million rubles of products above the plan. To complete the plan for 1980 in production volume for gross and actual production by 24 December and to manufacture 500,000 rubles worth of products above the plan. To ensure a growth in labor productivity by 1.7 percent above the established goal. To economize 50 tons of metal, 585,000 kilowatt hours of electric power, 20 tons of conventional fuel and 60 tons of charged materials. To increase capital yield by 10 percent. To develop series production of presses with SM-296 screw conveyor assemblies for the production of drainage pipes during the first half of 1980.

To fulfill the five-year plan for the technological reequipment of the plant ahead of schedule by 7 November 1980 and additionally to produce and put into operation a parts warehouse, to organize a completely mechanized section for assembly and testing of hydraulics and to introduce an air-plasma unit for cutting screw conveyor sections. To increase the level of mechanized labor for the plant to 64.5 percent and the level of mechanization and automation for welding work to 71.5 percent. To manufacture test models of a centrifugal pneumatic sifter [TsPG] and an SMA-259 boiling layer separator. To increase the relative proportion of products with the State Seal of Quality to 26 percent and the release of products after a single inspection to 98.6 percent.

To accomplish complex measures to further improve working conditions for workers in plant shops, to ensure accommodations in a sanatorium and a holiday home for no less than 500 plant workers, to attract no

less than 1500 people to physical fitness and sports activities and of those to train 10 candidates as masters of sports and first class athletes and 325 as common class athletes.

The complex communist labor crew for producing casting equipment in the Sverdlovsk "Pnevmostroymashina," which is supervised by N. I. Lenakov, USSR State prize laureate and reliable innovator in the RSFSR, is competing under the slogan: "The five-year plan leads up to the anniversary of the birth of V. I. Lenin!" The crew met the goals of the fourth year of the five-year plan in March 1979. Labor productivity increased by 6.4 percent in comparison with 1978. The manufactured equipment is only of the highest quality. The crew produced 52 pneumatic burnishing machines for mechanized shops in the plant which made it possible to mechanize manual labor; they manufactured and introduced a special chuck for attaching a cutting tool for drilling large holes and as a result of utilizing it, labor productivity for cutting operations increased by 30 percent. A new design for a water cooled ingot mold was developed. Crew members introduced about 10 innovative suggestions during the year which resulted in a savings of 14,500 rubles.

In 1980 the crew's collective took on the obligations: to fulfill the goals of the five-year plan for production volume by 20 February 1980 and to complete the goals for a 6th year until the end of the five-year plan; to increase labor productivity by 5 percent and to improve the quality of manufactured equipment for which they will: manufacture and introduce a new design for ingot mold inserts on a 210.25 hydraulic motor that would ensure the uniformity of dimensions for all ingot molds as well as introduce production of components in forms and molds for electric erosion machines according to the techniques suggested by the All-Union Institute of Technology for Construction and Road Machine Building; to manufacture 120 pneumatic tools for mechanizing manual labor in basic production; to register 3,000 rubles as the personal savings of the crew by means of innovative suggestions.

Lathe operator N. F. Popov has been working at the Voronezh production association imeni Comintern for 15 years and is a communist labor shock worker, a worker who produces work of outstanding quality and a mentor.

Competing under the slogan "Not one laggard nearby," N. F. Popov achieved remarkable results in 1979: he fulfilled the annual plan by 24 August and by the end of the year had turned out 8,900 rubles worth of products above the plan. By means of introducing progressive technology, applying advanced labor methods and by streamlining production processes, he increased labor productivity by 33 percent since the beginning of the five-year plan. He works in his own personal manner. He himself does small repairs and preventive maintenance.

on his machine which ensures that the equipment operates without breakdowns. In 1979, due to the remarkable labor achievements and the high qualitative indices obtained by means of introducing advanced methods of work and an improvement in labor organization, he was awarded the USSR State Prize. Previously for his valiant labor, Nikolay Fedorovich was awarded the Order of the October Revolution and a medal "For valiant labor. To mark the occasion of the 100th anniversary of the birth of V. I. Lenin."

Entering the concluding year of the 10th five-year plan, N. F. Popov took on such obligations: to turn 1980 into a year of fast pace work and to work in the manner of Lenin; to completely fulfill the plan for 7 years by the anniversary of the birth of V. I. Lenin; to increase labor productivity since the beginning of the five-year plan by 40 percent; to complete the plan for 1980 by Machine Builders' Day; and to produce 6,300 rubles worth of products above the plan by the end of the year.

The collectives of scientific production associations, scientific research, structural design and structural organizations, transforming into reality the CPSU Central Committee and USSR Soviet of Ministers Decree "Concerning an Improvement in Planning and Increasing the Influence of the Economic Mechanism to Improve Production Efficiency and the Quality of Work," the decisions of the November 1979 CPSU Central Committee Plenum and the instructions given by comrade L. I. Brezhnev at this plenum, and striving to introduce scientific developments into production as quickly as possible and strengthen the close ties between scientific organizations and plants, have broadly expanded socialist competition to complete subject plans and quotas ahead of schedule, to introduce scientific achievements into the national economy as soon as possible and to fittingly greet the 110th anniversary of the birth of V. I. Lenin.

As in past years much attention is being given to socialist competition between collectives in scientific and industrial enterprises, and to concluding agreements of creative cooperation. The repeating winners of socialist competition in the sector are coming forward as initiators of such a competition--the NPO [expansion unknown] of the "All-Union Scientific Research Institute for Construction and Road Machine Building," the "All-Union Planning Technological Institute for Construction and Road Machine Building," "VNIISMI" [expansion unknown], "VKTI for Construction and Road Machine Building," VKTI for Construction and Road Machine Building Institutes, "Giprostrommash," and GPI for Machine Building."



In their socialist obligations and agreements of creative cooperation with the collectives of industrial enterprises, scientists are taking on obligations to render assistance to enterprises, to increase the quality and technological level of equipment which is turned out; to introduce new technological processes and technological equipment for perfecting the technology of production at enterprises in the sector; to reduce the time it takes to develop and introduce into production articles that are being prepared for certification and precertification for the State Seal of Quality and new technology that is being created on a level with and higher than the best equivalents abroad; to design, produce and introduce means of mechanization and automation; to introduce advanced methods of engineering calculations by using an EVM.

Our colleagues in the Ministry and the Central Committee Presidium of the Heavy Machine Building Workers' Trade Union have approved of the initiative by the plant collectives, crews and foremost production workers and have expressed their firm conviction that workers, technical engineering, and scientific personnel in the sector, having broadly expanded socialist competition to successfully complete the goals of the 10th Five-Year Plan, will make the concluding year of the five-year plan a year of fast pace work in the manner of Lenin, will apply all their efforts, knowledge and experience to transform into reality the decisions of the November 1979 Plenum of the CPSU Central Committee and the instructions by comrade L. I. Brezhnev, General Secretary of the CPSU Central Committee and Chairman of the USSR Supreme Soviet for fulfilling and overfulfilling the plan for 1980 and the five-year plan as a whole and for improving production efficiency and the quality of work, will fittingly greet the 110th anniversary of the birth of V. I. Lenin, and will actively expand the preparations for the 26th Party Congress.

#### Equipment Listing

Moscow STROITEL'NIYE I DOROZHNIYE MASHINY in Russian No 3, 1980 pp 22-24

[Article: "Technological Equipment Products List Which are in Series Production at Plants in the Ministry of Construction, Road and Municipal Machine Building for Producing Reinforced Concrete Structures and Components ]

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features
Machines and Equipment for Transporting and Pouring Concrete Mixtures	
SMZh-71A. Concrete distributor for conveying concrete into the form. It is used	Capacity of the hopper--1.8 cubic meters. Gauge--1,000 mm. Width of feeder belts--500 mm. Speed of travel for the distributor--12 meters

\*Continuation, for the previous part see issues No 1, 2 1980 of this magazine.

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features
primarily for producing long reinforced concrete components for industrial construction. Kuybyshev "Strommashina"	per minute. Feeder belt speed--0.1 and 0.2 meters per second. Maximum angle for raising the boom of the feeder belt--15°. Established power--14.1 kilowatts. Overall dimensions in mm: (maximum) turning radius--4,350, length--6,640, width--2,810, height--4,210. Mass--6.3 tons.
SMZh-106A. Concrete distributor for conveying concrete into box-type forming devices. Kuybyshev "Strommashina"	Output--125 tons per hour. Gauge--1,100 mm. Speed of travel--0.2 meters per second. Speed of belts--1 meter per second. Width of feeder belts--650 mm. Established power--4.5 kilowatts. Overall dimensions (length x width x height)--9.2 x 5.8 x 2.4 meters. Mass--6.2 tons.
SMZh-69A. Concrete placing device for placing concrete into a form and for smoothing out the concrete mixture when producing panels up to 2 meters that have multiple voids. Kuybyshev "Strommashina"	Hopper capacity--2 cubic meters. Gauge--2,800 mm. Output of feeder belt--2.5 cubic meters per minute. Belt speed--10 meters per minute. Width of belts--2,000 mm. Speed of travel for the placing device--12.4 and 18.8 meters per minute. Established power--6.3 kilowatts. Overall dimensions (length x width x height)--7.6 x 4.1 x 3.1 meters. Mass--4.6 tons.
SMZh-1507. Concrete placing device for conveying, placing and smoothing out concrete mixtures when forming components with widths up to 3,600 mm. Kuybyshev "Strommashina"	Has a single hopper. Hopper capacity--2.5 cubic meters. Gauge--4,500 mm. Speed of travel--1.8; 3.8; 5.9; 11.6 meters per minute. Feeder belt speed--6 meters per minute. Speed of raising and lowering the vibration attachment--2.1 meters per minute. Number of dual motions for the leveling bar--59 in a minute. Established power--16.3 kilowatts. Overall dimensions (length x width x height)--3.1 x 6.3 x 3.1 meters. Mass--10.5 tons.
SMZh-162. Concrete placing device for conveying, placing and smoothing out concrete mixtures when forming ribbed roof and floor panels with widths up to 3,600 mm. Kuybyshev "Strommashina"	Has 3 hoppers. Hopper capacity--1; 2; 3 cubic meters. Gauge--4,500 mm. Width of feeder belts under the hoppers; one large one--1,400 mm and two small ones--800 mm. Speed of travel of the concrete placing device--1.8; 3.8; 5.9; 11.6 meters per minute. Number of dual movements by the leveling bar--59 in a minute. Established power--23.9 kilowatts. Overall dimensions (length x width x height)--5.2 x 6.3 x 3.1 meters. Mass--14.5 tons.
SMZh-166A. Concrete placing device for placing concrete into a form when producing	Has two hoppers. Hopper capacity--2.1 and 1 cubic meter. Gauge--4,500 mm. Speed of travel for the portal--4.7; 9.6; 15; 29.7 meters per

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features
<p>components with a width up to 3,600 mm. Kuybyshev "Strommashina"</p>	<p>minute. Speed of travel for the car with the hoppers--5.9 meters per minute. Leveling device in the form of a bar which performs back and forth motions across the component. Established power--20 kilowatts. Overall dimensions (length x width x height)--5.2 x 6.3 x 3.1 meters. Mass--12 tons.</p>
<p>SMZh-1A and SMZh-1B. Distributing hoppers with a trailer for transporting a concrete mixture from the concrete mixing shop to the concrete mixture placing station. It consists of SMZh-2A or SMZh-2B hoppers and an SMZh-3A bucket. In the absence of an SMZh-1B hopper the SMZh-1A hopper has no electrical cabinet and is operated from the shop's control panel. Kokhma "Strommashina"</p>	<p>Capacity of the hopper and bucket--2.4 cubic meters. Speed of travel--40 and 60 meters per minute. Gauge--1,720 mm. Established power--0.4 kilowatts. Overall dimensions of the SMZh-2A (SMZh-2B) (length x width x height)--4.2 x 1.9 x 1.5 (4.5 x 1.9 x 1.5) meters. Mass--3.35 (3.6) tons.</p>
<p>SMZh-2A and SMZh-2B. Distributing hoppers for transporting a concrete mixture from the concrete mixing shop to the concrete mixture placing station. In the absence of an SMZh-2B hopper the SMZh-2A has no electrical cabinet and is operated from the shop's control panel. Kokhma "Strommashina"</p>	<p>Hopper capacity--2.4 cubic meters. Speed of travel--40 and 60 meters per minute. Gauge--1,720 mm. Established power--0.4 kilowatts. Overall dimensions SMZh-2A (SMZh-2B) (length x width x height)--2.7 x 1.9 x 1.5 (2.8 x 1.9 x 1.5) meters. Mass--2.1 (2.2) tons.</p>
<p>SMZh-3A. Bucket for transporting a concrete mixture. Kokhma "Strommashina"</p>	<p>Capacity--1.2 cubic meters. Gauge--1,720 mm. Established power--0.4 kilowatts. Overall dimensions (length x width x height)--1.7 x 1.6 x 1.5 meters. Mass--0.925 tons.</p>
<p>SMZh-219. Bucket for transporting a concrete mixture from the concrete mixer to the forming shop. Lisichansk "Strommashina"</p>	<p>Capacity--1.4 cubic meters. Established power--0.6 kilowatts. Overall dimensions (length x width x height)--1.5 x 1.2 x 1.3 meters. Mass--0.47 tons.</p>
<p>SMZh-276. Hopper for placing concrete into forms for ventilating block sections. Lisichansk "Strommashina"</p>	<p>Capacity--2 cubic meters. Established power--4.94 kilowatts. Mass--1.31 tons.</p>

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features
<p style="text-align: center;">Machines for Compacting Concrete Mixtures. Special Forming Equipment, Pans and Forms, Mechanisms for Dismantling, Assembling, Cleaning, and Lubricating Forms.</p>	
<p>The SMZh-187A vibration platform with a load capacity of 10 tons for compacting concrete mixtures in forms is an all-purpose piece of forming equipment. The forms are fastened to the vibrating platform by electromagnets. It is assembled from standardized components. Chelyabinsk "Strommashina"</p>	<p>Type of vibration--single frequency vertically aligned. Vibration frequency--2,700-3,000 per minute. Vibration amplitude--0.2-0.5 mm. Number of vibration units--8. Established power--60 kilowatts. Maximum dimensions of the form being vibrated in meters: length--6, width--3. Overall dimensions in mm: length--8,500, width--2,986; 2,678; height--664. Mass in tons: total--6.5, vibrating parts--3.1.</p>
<p>SMZh-200A. Vibration platform with a load capacity of 15 tons. The structure is similar to the SMZh-187A platform and is completely standardized with it. Chelyabinsk "Strommashina"</p>	<p>Number of vibration units--8. Established power--88 kilowatts. Maximum dimensions of the form being vibrated in meters: length--6; width--3. Overall dimensions in mm: length--10,260, width--2,986 (2,406), height--664. Mass in tons: total--6.95, vibrating parts--3.1.</p>
<p>SMZh-199A. Vibration platform with a load capacity of 24 tons. The structure is similar to the SMZh-187A and SMZh-200A vibration platforms and is completely standardized with them. Chelyabinsk "Strommashina"</p>	<p>Number of vibration units--16. Established power--120 kilowatts. Maximum dimensions of the form being vibrated in meters: length--12, width--3. Overall dimensions in mm: length--15,070, width--3,006, height--664. Mass in tons: total--13.5, vibrating parts--5.4. Load capacity (maximum)--up to 56 tons.</p>
<p>SMZh-164. Vibration platform for compacting concrete mixtures in forms when producing reinforced concrete components for transport construction. Chelyabinsk "Strommashina"</p>	<p>Number of vibration units--10, with a load capacity of up to 4 tons each. Vibration frequency--2,700-3,000 per minute. Amplitude of vibration--0.2-0.5 mm. Force of attraction of one magnet--12 ton force (120 kilonewtons). Established power--234.5 kilowatts. Overall dimensions in mm: length--18,900, width--3,040, height--720. Mass in tons: total--16.15, vibrating parts--8.63.</p>

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features
<p>SMZh-255. Hoisting rails for lowering the form onto the vibration platform, lifting the form with the formed component from the vibration platform to the conveying surface and raising and lowering the form and components to transferring devices on conveyor lines at large panel housing construction plants. They operate together with the SMZh-3003A pumping apparatus.</p> <p>Chelyabinsk "Strommashina"</p>	<p>Load capacity--20 tons. Hoisting height--170 and 320 mm. Overall dimensions in mm: (greatest) length--7,000, (greatest) width--4,530, height--1,620. Mass--4 tons.</p>
<p>SMZh-3010A. A pan for forming panels on conveyor lines at large panel housing construction plants. They operate together with edge equipment which is manufactured, as a rule, by construction ministries under whose supervision is the KPD [Large Panel Housing Construction Plant].</p> <p>Bologoye "Strommashina"</p>	<p>Maximum dimensions of the components to be formed in mm: length--7,200, width--3,100, thickness--400. Gauge of rails--3,340 mm. Overall dimensions (with edge equipment) in mm: length--8,000, width--3,558, height--730. Mass--4.85 tons.</p>
<p>SMZh-3002B. A device for stripping the edges of the form on conveyor lines at KPD plants when the panels are being withdrawn and while working with the forms on an SMZh-3010A pan base. It operates together with the SMZh-3003A pumping apparatus.</p> <p>Bologoye "Strommashina"</p>	<p>Force when opening the longitudinal edges--(82 kilonewtons) 8200 kg force. Pulling force of the mechanism which fixes the form--(54.5 kilonewtons) 5,450 kg force. Overall dimensions in mm: length--6,960-10,060, width--6,100-6,600, height--1,400. Mass--6.9 tons.</p>
<p>SMZh-3004B. A device for closing the edges on conveyor lines at KPD plants when preparing the form for receiving concrete. It operates together with the SMZh-3003A pumping apparatus.</p> <p>Bologoye "Strommashina"</p>	<p>Force when closing the edges in kg force (kilonewtons): longitudinal edges--7,500 (75), transverse edges--5,900 (59). Pulling force of the mechanism which fixes the form (58 kilonewtons) 5,800 kg force. Overall dimensions in mm: length--5,660-8,760, width--6,740-7,240, height--870. Mass--5.56 tons.</p>



Index, Name, Purpose, Plant Manufacturer	Brief Technological Features			
SMZh-253, SMZh-3212, SMZh-3222. Box forms for vertically forming non-bearing roof panels, interior walls, dividing walls and floors for large panel housing units that have "narrow spacing." They work together with machines that strip forms, with which they comprise a box forming apparatus. Zhdanov metal structures plant in the Ukrainian SSR Ministry of Instal- lation and Special Construction Work.	Parameters	SMZh-253	SMZh-3212	SMZh-3222
	Maximum dimensions of the component being formed in mm:			
	length	7200	6000	6000
	height	3560	3000	3400
	thickness	140; 160; 120	140; 160; 120	50
	Number of sections	10; 12	10; 12	12; 14
	Dimensions of the forming plate in mm:			
	length	8000	6800	6800
	height	3760	3300	3760
	Number of vibrators	24	12	28
	Type of vibrator	IV-68	IV-68	IV-68
	Established power in kilowatts	8; 9.6	4; 4.4	9.6; 11.2
	Overall dimensions of the box form in mm:			
	length	9520	8320	8300
SMZh-3302, SMZh-3312, SMZh-3322. Box forms. Intended for the same purpose as the forms that are indicated above. Plant manufacturer is the same.	width	3860	4050	3300
	height	4730	4247	4700
	Mass of the box form in tons	100; 116	72; 83	105.6; 92.4
	Parameters	SMZh-3302	SMZh-3312	SMZh-3322
	Maximum dimensions of the component being formed in mm:			
	length	7200	6000	6300
	height	3000	3000	2700
	thickness	140; 160; 120	140; 160; 120	60
	Number of sections	10; 12	10; 12	12; 14
	Dimensions of the forming plate in mm:			
	length	6000	6800	6800
	height	3300	3300	3300
	Established power in kilowatts	4; 4.8	4; 4.8	4.8; 5.6

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features			
	Parameters	SMZh-3302	SMZh-3312	SMZh-3322
SMZh-252B, SMZh-3301B. Machines for stripping and assembling box forms. Together with the box forms they comprise a unified box forming ap- paratus. The hydro-actua- tor operates by means of SMZh-3003A pumping apparatuses. Kokhma "Strommashina"	Number of vibrators	10	12	14
	Type of vibrator	IV-68	IV-68	IV-68
	Overall dimensions			
	of the box form in mm:			
	length	9500	8300	8300
	width	4100	3900	3300
	height	4300	4300	4300
	Mass of the box form in tons	90; 104	72; 83	83.5; 95.7
	Parameters	SMZh-252B	SMZh-3301B	
SMZh-3221B, SMZh-3311B. Machines for stripping and assembling box forms. Intended for the same purpose as for the above mentioned machines. Plant manufacturer is the same.	Greatest displacement of the walls of the form in mm	850±50	850±50	
	Duration of full dis- placement of the walls	50	50	
	of the form in seconds	SMZh-253	SMZh-3302	
	Operates with box form			
	Overall dimensions in mm:			
	length	8980	8980	
	width	6430	6550	
	height	3210	3125	
	Mass in tons	26.1	27.2	
	Parameters	SMZh-3221B	SMZh-3311B	
	Greatest displacement of the walls of the form in mm	850±50	850±50	
	Duration of full dis- placement of the walls	50	50	
	of the form in seconds	SMZh-3222	SMZh-3212;	
	Operates with box form		SMZh-3312;	
			SMZh-3322	
	Overall dimensions in mm:			
	length	7780	7780	
	width	5420	6190	
	height	3150	3075	
	Mass in tons	19.5	20.2	

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features
<p>SMZh-259. Machine for cleaning box forms SMZh-253, SMZh-3212, SMZh-3222, SMZh-3302, SMZh-3312, and SMZh-3322 of hardened particles of concrete that have become stuck to the form.</p> <p>Kokhma "Strommashina"</p>	<p>Productivity--105 square meters per hour. Speed of lowering and raising the cleaning mechanism--3.5 meters per minute. Speed of movement for the car--3.5 meters per minute. Frequency of revolutions for the operating element--280 revolutions per minute. Gauge of the rails--9,300 mm. Established power--10.5 kilowatts. Overall dimensions in mm: length--9,990, width--2,235, height--5,840. Mass in tons--4.4.</p>
<p>SMZh-227. A forming machine for producing roofs or floors with multiple voids while simultaneously compacting the concrete mixture in a flat slab. It is part of the line for producing panels.</p> <p>Kokhma "Strommashina"</p>	<p>Overall dimensions of the components which are being produced in mm: length--6,260, width--990; 1,190; 1,590, height--220. Maximum force when extracting the void generating vibrator--(131 kilonewtons) 13,100 kg force. Speed for extracting the void generating vibrator--0.156 meters per second. Established power--33 kilowatts. Overall dimensions in mm: length--12,540, width--2,330, height--994. Mass--9.45 tons.</p>
<p>SMZh-228. Self-propelled portal with a vibration panel and edge equipment for transporting pans and apparatus to the forming station and for withdrawing the edge equipment and weighed down vibration panel. It operates as part of a line with the SMZh-227 machine.</p> <p>Kokhma "Strommashina"</p>	<p>Load capacity of the hoisting drive mechanism in tons: edge equipment--4.25, vibration panel--1.2. Speed of movement for the portal--18 meters per minute. Speed of raising and lowering the edge equipment and pan--0.05 meters per second. Speed of raising and lowering the vibration panel--0.11 meters per second. Established power--11.7 kilowatts. Overall dimensions in mm: length--7,250, width--3,950, height--3,070. Mass with full complement of panels and edge equipment--14.8 tons.</p>
<p>SMZh-229. Pan for forming panels with multiple voids assisted by electric heating. It has a prestressed bar which tightens the pan. After forming, the edge equipment is stripped off (by an instantaneous stripping method). It is part of a line with the SMZh-227 machine.</p> <p>Cherkassy "Strommashina"</p>	<p>Maximum dimensions of the components being formed in mm: length--6,260, width--990; 1,290; 1,590, height--220. Number of tightening rods--5; 6; 8. Force received from the tightened rod in ton force (kilonewtons): from one rod--up to 15 (150), 25 (250); total with 8 rods--up to 122 (1220). Overall dimensions in mm: length--6,744, width--1,840, height--402. Mass--2.8 tons.</p>

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features
<p>SMZh-340. Device for forming sanitary engineering tanks. Intended for producing volumetric reinforced concrete "bell" type SK-13 and SK-14 sanitary engineering tanks for large panel housing units in series 111-90 and others. Water system supply is provided by the SMZh-346 pumping apparatus. Lisichansk "Strommashina"</p>	<p>Overall dimensions of the components being formed in mm: length--2,730, width--1,600, height--2,310. Maximum force generated by the hydro-actuator when stripping (400 kilonewtons) 49,000 kg force. Effective pressure of the liquid in the hydro-actuator (10 megapascal') 100 kg force per square cm. Established power--22 kilowatts. Overall dimensions of the apparatus in mm: length--5,490, width--4,360, height--400. Mass--16 tons.</p>
<p>SMZh-341. Apparatus for forming sanitary engineering tanks. Intended for producing volumetric reinforced concrete "bell" type SK-13 and SK-16 sanitary engineering tanks for large panel housing units series 111-90 and others. Water system supply is provided by the SMZh-346 pumping apparatus. Lisichansk "Strommashina"</p>	<p>Overall dimensions of the components being formed in mm: length--2,080, width--1,820, height--2,310. Maximum force generated by the hydro-actuator when stripping--(400 kilonewtons) 40,000 kg force. Effective pressure of the liquid in the water system--(10 megapascal') 100 kg force per square cm. Established power--22 kilowatts. Overall dimensions of the apparatus in mm: length--4,620, width--4,360, height--4,000. Mass--14.5 tons.</p>
<p>SMZh-271. Form for ventilating modular units. Intended for VV-1 ventilating modular units in housing units series 111-90. Water system supply is provided by the SMZh-346 pumping apparatus. Lisichansk "Strommashina"</p>	<p>Maximum size of the articles being formed in mm: length--880, width--300, height--2,780. Effective pressure in the hydro-actuator (10 megapascal') 100 kg force per square cm. Established power--24 kilowatts. Overall dimensions of the form in mm: length--4,842, width--3,682, height--5,100. Mass--13.2 tons.</p>
<p>SMZh-272. Form for elevator shafts. Intended for producing ShL-1, ShL-2, ShL-3 elevator shafts in large panel housing units series 111-84 and 111-90. Lisichansk "Strommashina"</p>	<p>Overall dimensions of the elevator shafts being formed in mm: length--1,920, width--1,770, height--2,780, 2,060. Effective pressure in the hydro-actuator (8 megapascal') 80 kg force per square cm. Established power--1.2 kilowatts. Overall dimensions of the form in mm: length--4,682, width--4,532, height--4,520 (4,580). Mass--15.84 tons.</p>
<p>Forms for producing components for industrial and water management construction. Bologoye, Kokhma and Lisichansk "Strommashina"</p>	<p>A limited products list of forms that are being produced are subject to coordination with plant manufacturers.</p>

Index, Name, Purpose, Plant Manufacturer	Brief Technological Features		
SMZh-169A. A roller centrifuge for forming and compacting concrete mixtures in forms when producing reinforced concrete columns for supporting the lighting contact system and LEP [lighting power lines]. Lisichansk "Strommashina"	Dimensions of the components being formed in mm: diameter--up to 500, length--up to 13,500. Diameter of the band around the form--500-700 mm. Diameter of the supporting rollers--500 mm. Diameter of the safety rollers--200 mm. Frequency of revolutions for the supporting roller--211, 315, 374, 628 revolutions per minute. Established power--55.4 kilowatts. Overall dimensions in mm: length--17,080, width--3,450, height--1,286. Mass--11.2 tons.		
7588/02V. Form for producing reinforced concrete centrifuged columns with a length of 11 meters in an SMZh-169A centrifuge. Lisichansk "Strommashina"	Dimensions of the components being formed in mm: diameter--500, length--11,000. Dimensions of the form in mm: length--12,032, (greatest) diameter--500. Mass--2.4 tons.		
SMZh-18A. Apparatus for the centralized preparation of OE-2 emulsion lubricants and for applying it to the working surfaces of the form. Kokhma "Strommashina"	Productivity--0.5 cubic meters per hour. Effective capacity of the reservoir in cubic meters: for emulsion--0.44, for lime mortar--2 x 0.75, of the mixer--2 x 0.25. Established power of the mixer--0.55 kilowatts. Supply from the pump in cubic meters per hour: for emulsion and prepared lubricants--1.1, for lime mortar--3.6. Established power--25.9 kilowatts. Overall dimensions in mm: length--2,520, width--1,985, height--2,190. Mass--2.35 tons.		
SMZh-3003A and SMZh-3333-02. Pump apparatuses for supplying the hydro-actuators of equipment which is operating at large panel housing construction plants. Kokhma "Strommashina"	Parameters	SMZh-3003A	SMZh-3333-02
	Supply in meters per minute Reservoir capacity in liters Effective pressure in kg force per square cm (megapascal') Established power in kilowatts Mass in tons	50 250 50(5) 7.5 0.5	50 250 50(5) 7.5 0.375



Index, Name, Purpose, Plant Manufacturer	Brief Technological Features
SMZh-346. Pumping apparatus for supplying the hydro-actuators of devices for forming volumetric reinforced concrete elements. Lisichansk "Strommashina"	Supply--12 liters per minute. Reservoir capacity--160 liters. Effective pressure--100 kg force per square cm (10 megapaskal'). Established power--4 kilowatts. Overall dimensions in mm: length--890, width--690, height--1,078. Mass--0.34 tons.

(Continued in the next issue of this magazine)

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## CONSTRUCTION

### NEW ECONOMIC MECHANISM IN CONSTRUCTION

#### Lithuanian Experience

Moscow EKONOMICHESKAYA GAZETA in Russian No 10, 1980 p 9

/Article by Yu. Kuplyauskas, chief of the Sector of the Effectiveness of Capital Investments of the Scientific Research Institute of Economics and Planning of the National Economy of the Lithuanian SSR State Planning Committee (Vil'nyus): "What Lies Behind the Line of the Report"

/Text The measures on improving the economic mechanism in construction will unquestionably affect the area of economic and statistical information. Primary accounting and the statistical reports compiled by organizations, of course, play a basic role in the flow of information. They serve as a tool for the evaluation of economic and financial activity and the discovery of reserves for expediting and reducing the cost of construction. In this article it will be a question of the forms of reporting. Not all the information, which is now reflected in them, is effective and adequately helps to improve management and planning and to evaluate objectively the activity of collectives of construction workers.

Let us take, for example, form l-ks "On the Fulfillment of the Plan of Contract Work." Construction organizations fill it out each month. About 400 indicators are reflected in the mentioned report. But the duration of the construction in months is not taken into account. Only the dates, which indicate in what quarter of the year it is planned to place the project into operation, are used. It would seem that, by knowing the date of the start and the standard of the duration of construction in months, it is also easy to plan the date of the delivery of the project. But in practice such a method is rarely used. First, frequently the clients, without observing the standards of the duration of construction, spread the capital investments and the amounts of construction and installation work among different projects. Second, during the year under review the contractor does not put all the projects into operation. Later these construction projects, since it is necessary to complete them, have to be carried over to the plan of the following year and new dates of placement into operation have to be specified. Thus, the plan indicators do not conform to the standards of the duration of construction.

An administrative building in Vil'nyus should have been built according to the standards in 45 months. The Vil'nyus Construction Trust at the very start planned to perform the work in 57 months, having specified as the planned date of delivery the fourth quarter of 1979. But placement into operation did not occur. Thus, instead of the standard of 45 months it is turning out to be 69 months according to the plan. In 1979 the Kaunas Construction Trust did not put into operation the acetate fiber shops of the Kaunas Synthetic Fiber Plant, an addition to the hospital, shops of the Palemonskiy Ceramics Plant and the building of the experimental production base of the scientific research institute of the republic State Committee for Construction Affairs. New planned dates of placement into operation have been set in 1980 for all these projects. Such cases are not, unfortunately, of an isolated nature.

If we judge from the plans of contractors, the average duration of construction at the Kaunas Trust comes to 29.5 months as against 19.3 months according to the standards. At the Vil'nyus Trust it is correspondingly 20.7 and 16.5 months, at the Klaypeda Trust--20 and 15 months. It is appropriate to note that the timely placement of projects into operation has a great influence not only on the indicators of contracting organizations. Economists have calculated that with a shortening of the duration of construction by one month the national economy obtains additional savings of up to 1 percent of the estimated cost of the project. And, on the contrary, with a delay in construction the loss is just as great.

Unfortunately, in spite of the importance of this indicator, the prevailing procedure of planning and reporting does not oblige contractors to analyze the duration of construction, consequently they do not report on the observance of the standards to superior organizations.

The party and government decree of 12 July 1979 directs attention to the observance of the standards of the duration of construction. Therefore it seems expedient in the statistical report using form 1-ks to indicate, along with the date of delivery of the projects, the duration of their construction in months. Such an indicator should be used in accordance with the following attributes: the standard duration of construction of projects (capacities), the duration according to the plan of the contracting organization and the actual duration. It is also useful to stipulate this in statistical report 2-ks, which is drawn up by the client.

In form 3-t of the quarterly statistical report (on labor in construction) 170 indicators are specified, in that of the annual and semi-annual report more than 200 indicators are specified.

Although in the report using form 3-t there are many data, it is impossible to do without additional calculations. It is a matter of the coefficients of stability, the turnover of personnel, labor discipline and the use of working time. In our opinion, it is expedient to include all this in the statistical reports. This would make it possible on the basis of a uniform system to examine the indicators on labor and would promote the successful

implementation of the recent decisions on the further tightening up of labor discipline and the reduction of the turnover of personnel in the national economy.

The client draws up form 8-ks of the annual statistical report (on the enterprises under construction and being modernized), while the Central Statistical Administration draws up the consolidated form for the sector. More than 500 indicators are included here. Nearly all this information is of an informative nature. For neither planned nor standard results are alongside the actually achieved results. It is impossible to evaluate objectively the contribution of the client ministry to the concentration of capital investments and the fulfillment of the standards of the duration of construction according to the data available in the report.

It is necessary to note that at present much information circulates on the basis of intradepartment reports. This information is not systematized, is not standardized and is not legally acknowledged. The data on the quality of construction also belong here. So far it does not appear in the reporting. The level of quality is not planned and is not taken into account when evaluating the activity of the contracting organization. In our opinion, it would be more correct to evaluate the quality using a five-point system, that is, to calculate the average point rating of the quality as a whole for the contracting organization for the period under review. Such experience has already been gained in the system of the Lithuanian SSR Ministry of Rural Construction.

How is reporting to be improved? This question, in our opinion, must be solved comprehensively. It is necessary to take into account the effectiveness of the indicators which are specified in both the statistical and the intradepartment reports. Such an approach would make it possible to simplify the forms and to reduce the flow of information.

Contracting organizations, planning institutes, clients, planning and bank organs are awaiting work in this direction from the USSR Central Statistical Administration.

#### Komi ASSR's Experience

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Mar 80 p 2

[Article by Candidate of Economic Sciences N. Subbotin, chief of a sector of the Komi Division of the Scientific Research Institute of the Organization and Management of Construction (Syktyvkar): "Equal Interest, Equal Responsibility"]

[Text] It is planned to complete the changeover to the method of payments for the finished final construction product in 1981. The problem, it must be said frankly, is a most complicated one: the period is quite short, but much has to be done--including by us, the workers of the regional construction subdivisions and local institutions of construction science.

Here are but a few details in confirmation of the complexity of this problem. First, without the shortening of the periods of construction of projects it is no use to think about new interrelations of client and contractor. Second, it is really necessary to ensure the equality of the efforts and the equal interest and responsibility of the client and the contractor with all related industries and contractors, planning and financing organs. And, third, it is necessary to transform contracting organizations, in point of fact, into enterprises which produce a finished construction product.

The July (1979) decree of the CPSU Central Committee and the USSR Council of Ministers outlined the fundamental ways of solving these problems. As to the practice of construction, including in the Komi ASSR, it indicates: without the activeness and, what is the main thing, purposeful support "from below" the desired results might be slowly obtained.

The experience of settlements for the finished project or the start-up complex exists at construction projects of the republic. For example, the Promstroy Trust of the territorial main administration of the Ministry of Construction of Petroleum and Gas Industry Enterprises has been operating according to this system for five years now, while the Vuktylstroy and Zhilstroy trusts of this main administration and the Pechorshakhtostroy Combine of the USSR Ministry of the Coal Industry have been operating according to it for three years. The Komienergostroy Trust has been paying for work according to the final product in the construction of the Pechorskaya GRES.

But all the same, in my opinion, there are no grounds to believe that the achievements at some projects open the way to an easy solution of the problem.

The fact that at the mentioned Promstroy Trust, after the changeover to settlements for the finished project, the periods of construction were not shortened and the "unfinished construction" was not reduced, for example, attracts attention. As a result the trust has constantly been in a most difficult financial situation for a number of years now and has been upsetting the payments to suppliers for construction components, parts and materials and to transportation workers and machine operators for their services.

Unquestionably the builders themselves are also largely to blame here. The management of the trust--manager L. Garkusha, chief engineer Ye. Berman, the specialists of the divisions--has to improve considerably the work of all the links so that obstacles to the new payment and financial mechanism would not be raised on their part. But their efforts alone are inadequate. I will explain why.

It is striking that the client and the contractor do not have equal responsibility and interest. The game always takes place, as they say, between the goal posts: the experiment, while placing the contractor in a rigid



framework, does not affect his partner. Let us turn to the facts. The trust completed the construction work at the Ukhta Service Station. But the project was idle while waiting for equipment for nearly a year. The client--the Komi-NEFT' Industrial Association, which is headed by A. Gumenyuk--completed its delivery only last spring. As a result for the trust nearly 400,000 rubles disappeared from circulation into "unfinished construction" for a year, while the period of construction of the project was doubled. The client did not bear economic responsibility.

The different direction of interests is displayed most clearly here in the turning over of compressor stations (the client is the management of the main gas pipelines under construction) and petroleum pumping stations (the client is the administration of main petroleum pipelines under construction). The projects, start-up complexes and sections have already been in operation for a year or two, but all the work performed here is in the unfinished production for the trust. This is now millions of rubles.

The reason, it turns out, is that there are unfinished operations. A good half of them remained once again through the fault of the clients: standby equipment was not delivered and, of course, was not installed, a standby cable was not laid for the same reason and so on. The builders, naturally, were forced to do something according to a temporary plan. At times while waiting for better weather (the North is the North) they did not perform any of the outdoor operations. This happens, of course, and through their own fault they are not eliminating the unfinished operations. However, the adopted system of settlements does not take into account the degree of guilt: the general contractor suffers most of all. In the "unfinished construction" of the trust there are operations worth approximately 10 million rubles, which have been paid to subcontractors. Although the trust itself has not yet received anything from the client. And the latter is in no hurry to make payment: it is even profitable for him to operate the projects which have not been accepted from the builders.

According to legal standards the fact of the operation of any built project is regard as its acceptance by the client. Consequently, it is logical to complete this act by settlement with the contractor. Payment can be made less the value of the unfinished operations which are left through the fault of the builders. But in all instances a legal contradiction must not be allowed. I believe that a fine should be exacted from the client for the entire period of operation of the unfinished project and the expenses should be assigned to his industrial activity.

Such not so rare cases as when the unfinished operations on a start-up complex are still significant and come to 20-25 percent of the estimated cost, while the project, which is not ready for operation, is being dragged out by formal introduction, also make it incumbent to put the question this way. Such cases are not isolated. For example, the unfinished operations through the fault of both parties (the client and the contractor) at the Pechorukaya GRES on one of the power blocks were nearly 13 million rubles--about a quarter of the total estimate for the start-up complex. It simply was not ready on time.

So that the payment and financial mechanism being introduced would work at full strength, it seems to me, it is necessary to place the suppliers, specialized organizations and services under the same conditions as the general contractor: settlements of the builders with them should be made in conformity with how it is specified to make settlements of the client with the contractor.

Consequently, thorough and comprehensive preparation for the introduction of the new procedure of settlements for construction is necessary. Obviously, there is the need to set up in the regions control and methods organs, which would enjoy daily attention on the part of party and soviet workers. One of the priority tasks of such methods centers is to increase sharply the level of economic work at construction organizations.

#### Official Comments

Moscow STROITEL'NAYA GAZETA in Russian 13 Mar 80 p 2

/Report on discussion between V. Il'in, chief of the Construction Economics Department of USSR Gosstroy; A. Zhuk, chief of Estimate Norms and Price Fixing in Construction Department of USSR Gosstroy; V. Balakin, deputy chief of the Building and Construction Industry Department of USSR Gosplan; V. Shilov, deputy chief of a subdepartment of the Introduction of New Methods of Planning and Economic Incentives Department of USSR Gosplan; A. Savitskaya, chief of the Planning Administration of the All-Union Bank for the Financing of Capital Investments; V. Vlasov, chief of the Wage Control Department of the All-Union Bank for the Financing of Capital Investments; discussion led by S. Volkov and A. Kuznetsov: "The Strategy for Tomorrow"/

[Text] The conversation at the business meeting held at the editorial office of STROITEL'NAYA GAZETA was about the implementation of the decree of the CPSU Central Committee and the USSR Council of Ministers, "On the Improvement of Planning and the Intensification of the Influence of the Economic Mechanism on the Increase of Production Efficiency and Work Quality." V. Il'in, chief of the Construction Economics Department of USSR Gosstroy; A. Zhuk, chief of the Estimate Norms and Price Fixing in Construction Department of USSR Gosstroy; V. Balakin, deputy chief of the Building and Construction Industry Department of USSR Gosplan; V. Shilov, deputy chief of a subdepartment of the Introduction of New Methods of Planning and Economic Incentives Department of USSR Gosplan; A. Savitskaya, chief of the Planning Administration of the All-Union Bank for the Financing of Capital Investments; V. Vlasov, chief of the Wage Control Department of the All-Union Bank for the Financing of Capital Investments took part in the discussion.

V. Il'in: The decree of the CPSU Central Committee and the USSR Council of Ministers, which is being discussed today, specified and solved the fundamental questions of the improvement of the economic mechanism. It should be emphasized that its main principles are based on the results of large-scale experiments which were conducted in past years. First of all it is necessary to mention the work experience of the Belorussian Ministry of Industrial Construction, which in subsequent years became widespread at a number of major construction organizations--republic ministries and main administrations for construction.

Immediately after the issuing of the party and government decree much explanatory work was launched, which made it possible report its basic contents to a broad circle of managers, engineering and technical personnel and labor collectives. Today it can be said that the goal, which we were pursuing, was achieved by launching explanatory work.

At present a thorough analysis of the individual clauses of this most important document must be made, and the elaboration of methods and standard documents, which regulate planning, stimulation, payment and credit relations and the interrelations of the participants in construction, must also be stepped up. The goal is to approve the basic documents in the immediate future, since they are needed in the drafting of the plan for the 11th Five-Year Plan.

Correspondents: Thus, the three aspects of the discussion have been outlined: the promotion and explanation of the party and government decree; the course of the drafting of methods and standard documents; the adoption of the individual clauses in practice. If you do not object, we will adhere to this plan.

#### Explanatory Work

A. Savitakaya: It seems to me that no special explanatory work along the lines of the All-Union Bank for the Financing of Capital Investments is required. Such components of reorganization as the mechanism of credit extension, the procedure of settlements for commodity construction production and others have been well checked during the many years of experiments. I have in mind first of all the Belorussian experiment, the results of which were included almost completely in the decree. At one time the conditions of the experiment were widely disseminated, so that they are adequately well known in construction organization.

Nevertheless we issued instructions throughout our system to work in this direction with the construction organizations locally.

V. Shilov: There is reason to say that far from everything has yet been done on explaining the decree. The staff workers of our department, when giving lectures in various auditoriums throughout the country, frequently are confronted with a lack of understanding of some clauses. Moreover, newer and newer enforceable enactments, which also must be explained, are

being issued. It seems to me that one of the leading places in this matter should belong to STROITEL'NAYA GAZETA.

A. Zhuk: We plan to hold a number of group conferences and seminars with specialists and economic managers. You would not be blamed if it were said that many of them for the present do not conceive some important details of the improvement of the economic mechanism.

V. Shilov: Apparently, we must speak about making every worker aware of the content and goal orientation of the decree. And here it is difficult to draw a line between propaganda and instruction. They should go hand in hand. At the same time we should not forget that propaganda is most effective when it relies on a concrete "tool" of the realization of ideas.

Now it is very important to achieve as soon as possible a psychological reorganization, to overcome the force of inertia in the consciousness not only of planning workers, but also of designers and organizers of construction. At present in some organizations, and what is more in ministries they are not taking active steps to prepare properly for the reorganization. This is bad first of all because the contracting ministries and the organizations subordinate to them will not have the necessary time for the careful drafting of the plan for the 11th Five-Year Plan in accordance with the new indicators. But after all since 1980 the necessary enforceable enactments have existed for the changeover to settlements for completed start-up complexes and projects, which are ready to put out products and render services. The interdepartmental commission attached to USSR Gosplan in January of this year adopted a decision which established the procedure of evaluating activity, of covering planned expenditures and crediting the economic stimulation funds of construction and installation organizations, which have converted during the current year to the indicated procedure of settlements.

V. Balakin: The construction workers, of course, must launch preliminary work and this year adopt in practice many of the principles contained in the decree. But, while reproaching them we should not forget that until the contracting ministries obtain from us the necessary methods and standard documents, if only the main ones, they will not be able to do a lot. We should acknowledge the lag in the drafting of the documents.

Correspondents: Consequently, should we proceed to the second section of the discussion?

#### Drafting of Documents

V. Il'in: In speaking about enforceable enactments, it should be noted that at the end of last year USSR Gosplan and USSR Gosstroy approved project-by-project standards of the duration of construction and of the carry-over construction starts for the 11th Five-Year Plan. In the future average sectorial standards of the carry-over construction starts should be elaborated and approved. Data characterizing the sectorial structure of

construction are necessary for this. These standards are called upon to play a prominent role in the solution of such an important national economic problem as the reduction of the number of projects being built simultaneously, as well as the reduction of the amount of unfinished construction to the level which conforms to the technologically sound inventories.

Taking into account that during the years of the 10th Five-Year Plan the amount of unfinished construction, which now considerably exceeds the standard, increased steadily and the expenditures on projects under construction for a long time were taken into account in it, it is expedient to take a thorough inventory. It will make it possible to determine the real degree of readiness of construction projects and will create a reliable basis for the formulation of the plan for the next five-year plan.

A. Savitskaya: A few weeks ago the executives of the All-Union Bank for the Financing of Capital Investments signed instructions on the procedure of extending credit, including for the incomplete performance of construction and installation work. Instructions, which were put into effect on 1 January 1980, have been issued on the procedure of payment of bills for products when the buyers lack the capital.

A plan on differentiated interest rates, which are levied for the use of credit, has been drawn up. A fee of 0.5 percent (it was 1 percent) has been established for time loans, a fee of 5 percent has been established for overdue loans. As you see, there are no intermediate rates. We consider this procedure to be correct, since settlements will be considerably simplified and this will stimulate the construction workers more strongly to achieve the end result in the shortest possible time.

It can be said that the All-Union Bank for the Financing of Capital Investments is coping with its tasks. However, I cannot but point out that the periods for the drafting of documents should be lengthened, since too much time is being spent on getting agreement and on sending the documents from department to department.

V. Shilov: Of course, the obtaining of agreement would proceed more rapidly, if we sat down at the same table, as was the case at one time when the working group of the interdepartmental commission attached to USSR Gosplan was drawing up documents. I am speaking about the period when the preparation for the economic reform in construction was under way.

V. Balakin: Indeed, the lack of direct contacts between us is hampering the work somewhat. Interdepartment coordination, which, moreover, is set down in an official document, is necessary. It will be easier in the working groups to find a consensus.

Let us take the indicator of the commodity construction production. We sent the draft of the methods instructions on the planning of the commodity production to the construction ministries, the main clients and the interested departments. Valuable remarks were received from many. The main attention



was devoted to the question of determining the commodity production by capacities and projects with long periods of construction. This, too, is not surprising. Both the clients and the contractors look at this indicator differently. For example, at the Ministry of Transport Construction they assume without reason that the section of railroad, which has been placed into temporary operation, should be included in the commodity production. Moreover, the start of commercial traffic is also grounds for this; after all, freight is being hauled. You will not deny the logic of the economists from the Ministry of Transport Construction.

Various points of view are also being expressed concerning the planning of the amounts of commodity production, which are performed on one's own and according to a subcontract.

The necessary amendments were made in the draft of the methods instructions, and in the very near future this document will be sent to the performers.

A. Zhuk: Our department, incidentally, is alarmed by the lack of this method, since the work on the document on the standard net production is being held back. However, there are enough difficulties as it is.

But first about another section of the work assigned to our department. We prepared on time--and Gosstroy issued it--a decree reflecting the sectorial correction factors which should be used when determining the estimated cost of the operations on modernization and reequipment. The document will take effect on 1 January 1981.

A few words about the most interesting features for the builders. Thus, the standards of the overhead expenses for these operations have been increased by 10 percent. Higher coefficients have been established for the estimated cost. Depending on the complexity of the work on the modernization and reequipment of operating enterprises, the value of the coefficients will be 1.04 and 1.05. With allowance made for the now prevailing increasing coefficients an increase on the order of 8-12 percent is received as compared with the cost of the work in the case of new construction.

But now back to where I started: the preparation of the standard estimate base for the changeover to the planning of labor productivity according to the standard net production. This is a very complicated problem, which gives rise to conflicting opinions. It is hardly possible to take every wish into account, therefore Gosstroy dwelled on the following version: in the performance of construction and installation work the standard net production is the wage fund plus the total value of the expenditures on the operation of the machinery, a portion of the overhead and the planned savings. The expenditures of the builders on materials and components, as well as their expenditures on loading, unloading, handling, transportation and so on, which are not included in the cost, do not belong here.

This decision must be legalized by an official document. We believe that this procedure will eliminate the interest of the builders in the use of expensive materials, higher expenditures on transportation and so on.

I will not dwell on the extremely specific problems which have to be solved in creating the standard estimate base of the indicators of the standard net production. I will speak briefly about the revision of wholesale prices. In industry the new prices should be introduced in early 1982. The prices in construction also depend to a very great extent on the level of wholesale prices in industry. Unfortunately, the USSR State Committee for Prices greatly delayed the drafting of methods instructions on how to determine the indicator of the net production in wholesale prices.

The changeover to the new estimated standards and wholesale prices in construction will be implemented on 1 January 1984.

A natural question arises: what should be done until then? There can be only one answer: implement the measures stipulated by the party and government decree. First of all this pertains to planning organizations. In drawing up the plans and estimates for projects, the construction of which is being planned for 1981, the distinction of the indicator of the standard net production must be stipulated.

We must not wait until the directive organs issue all the documents. For there is a solution, which is suggested by the practice of some construction organizations, for example, the Lithuanian SSR Ministry of Construction, and in industry the Main Administration of the Construction Materials and Structural Parts Industry of the Moscow Gorispolkom and the Latvian SSR Ministry of the Construction Materials Industry, which use the indicator of the net production. They independently calculated this indicator and submitted the calculations for the approval of republic organs.

Suppose they were not able to achieve the ideal solution of the problem, suppose the calculated indicator in essence is the value added--this does not belittle in the least the importance of this step. It is important that the builders will acquire good experience. The initiative of these organizations must be disseminated more extensively.

V. Il'in: For the purposes of a gradual changeover of enterprises of the construction industry and construction materials industry and construction and installation organizations to the planning of labor productivity according to the standard net production, a plan of the appropriate measures of an organizational methods nature, as well as on the preparation of the standard estimate base and the elaboration of drafts of standards for planning and evaluating activity according to the net production has been drafted at USSR Gosstroy.

Correspondents: Pardon us, let us return to the theme of the discussion. It would be interesting to find out how the drafting of documents takes place in other departments, representatives of which are participating in the discussion.

V. Shilov: The Introduction of New Methods of Planning and Economic Incentives Department of USSR Gosplan, which I am representing here, holds

a central place in the drafting of standard acts on the improvement of management and planning and the intensification of the influence of the economic mechanism on the increase of production efficiency and work quality. All the standard documents on these questions pass through us, therefore the specialists of the department, perhaps, have the most complete idea of the state of affairs. And it is this: during the first half of the year 16 priority acts have to be prepared.

Among these documents are the main statutes on the formation and expenditure of economic stimulation funds. These documents, which will be in effect during 1981-1985, have been prepared and sent to the ministries, departments and union republics for agreement.

V. Il'in: The basing of all production operations on stable five-year plans (with a breakdown of the assignments by years), the lending of an invariable nature to the title lists and the increase of the responsibility of construction organizations for the achievement of the end result make it incumbent to make changes and refinements in the prevailing statutes, which regulate the interrelations of the participants in construction. In this connection USSR Gosstroy is revising the Regulations on the Agreements of the Contract, as well as the statutes on the interrelations of the general contractor with subcontracting organizations, and of clients and general contractors.

It is expedient for the contract between the client and the main contractor to be concluded for the entire period of construction, excluding here additional agreements. The amount of the penalties for the violation of the terms of contract should be increased, mutual granting of amnesty cannot be allowed, there is every reason to enhance the role of construction organizations in turning over the finished project to the state commission.

The improvement of the organizational forms of construction management occupies an important place in the system of the cost accounting mechanism. The decree of the CPSU Central Committee and the USSR Council of Ministers calls for the completion in 1981 of the changeover to the two- and three-level system of management. This means that the production construction and installation associations, and in some cases trusts, should become the main cost accounting unit. USSR Gosstroy drafted and approved jointly with USSR Gosplan the Instructions on the Procedure of the Drafting by Ministries and Departments of General Plans of Construction Management. Gosstroy has approved statutes on the all-union construction and installation association and on the production construction and installation association. The indicated documents define specifically the number of levels and the functions of the organs of management. Here it is borne in mind that the production construction and installation association is a production economic complex, the activity of which is oriented toward the achievement of the end results.

Today in the construction ministries everything is available for the extensive development of the work on preparing the general plans of management.

Correspondents: If we judge from some of the statements of the participants in the business meeting, it can be concluded that the drafting of methods and standard documents on the whole is proceeding normally, while delays are occurring for objective reasons. Consequently, does the matter depend on the construction ministries, which are poorly handling the preparation for the reorganization? We would like to hear your views on this.

#### Implementation of the Decree

A. Savitskaya: I believe that the builders have been in a difficult position, it has long been time to begin the preparation for the implementation of the decree, but there are not many enforceable enactments, which we have also discussed today.

However, it is impossible to acquit them entirely. Much could have already been done. For example, who, if not the contractors, should work with the clients on the formulation of the plans of the commodity construction production?! First of all the ministries and main administrations, which have been converted to the Belorussian experiment, deserve a reproach. The All-Union Bank for the Financing of Capital Investments in 1980 is allowed to convert for settlements for finished enterprises, projects and start-up complexes up to 30 percent of the amount of construction and installation work. The matter depends on the construction ministries.

V. Balakin: While reproaching the builders for being passive, we should not overlook one important circumstance, namely: today only the participants in the Belorussian experiment are capable of the complete implementation of the measures on the improvement of the economic mechanism. The others must start putting into effect more rapidly at least some principles. And first of all the settlements for finished projects and start-up complexes must be developed more extensively.

V. Shilov: Unfortunately, as was already noted here, the planning organizations were left out. In order to convert beginning next year to settlements for finished projects and complexes, all planning estimates must be prepared accordingly right now.

There is another important question, on which it is absolutely necessary to focus attention: the reorganization of material and technical supply in accordance with the needs which are determined according to the plans and estimates. We must worry about this now, but there are no instructions on this matter. Nothing is also known about the procedure of the complete supply of materials, items and parts to construction projects through the territorial organs of the USSR State Committee for Material and Technical Supply. Of course, I have in mind the meeting of the needs in accordance with the plans and estimates.

As was already stated, production associations, and in some cases trusts, should become the main cost accounting unit in construction. The necessary enforceable enactments, about which Comrade Il'in spoke, have been

issued. Yet none of the contracting ministries has yet drafted general plans of management. And the field of activity for them is broad. According to the data of the USSR Central Statistical Administration, there are still construction organizations which perform a volume of work of less than 1 million rubles a year.

There is another sore issue. About 20 percent of the construction organizations have not yet completed the economic reform which was stipulated by the party and government decree of 1969, although all the enforceable enactments, including on the conversion of subsidized organizations, exist for this. It is impossible to convert to the new conditions of management with two different systems of economic stimulation!

V. Balakin: The formulation of a five-year plan which is stable and balanced merits greater attention. The trusts and associations should soon submit their ideas on this. But they do not have an approved method of drafting five-year plans. The Scientific Research Institute of Economics of Construction and the institutes of the construction ministries need to expedite its elaboration, so that the construction and installation trusts could draft a detailed five-year plan with a breakdown of the assignments by years.

Correspondents: Thus, summarizing the discussion, it can be said that the drafting of methods and standard documents must be sped up in order to provide the construction ministries with them during the first half of this year. But at the same time the ministries and the construction organizations subordinate to them should not take the position of outside observers, but should actively introduce all the measures on the improvement of the economic mechanism, whichever ones possible. Such is the strategy for the not very distant future.

The editorial board thanks all the participants in the business meeting for the open exchange of opinions, for the interesting proposals and ideas, which, we hope, will find a response in the departments and construction ministries, which are involved in the reorganization.

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## CONSTRUCTION

### VARIOUS ASPECTS OF LATVIA'S CONSTRUCTION INDUSTRY SUMMARIZED

#### Positive, Negative Aspects

Riga SOVETSKAYA LATVIYA in Russian 29 Feb 80 p 1

[Article: "Build Ahead of Schedule--Develop Ahead of Schedule"]

[Text] The solidarity of our own Communist Party and the correctness of the legacy of Lenin were demonstrated to the workers of our republic as well as to all Soviet people at the past elections to the Supreme Soviets of the union republics and local soviets. Laborers of the republic are firmly resolved to fulfill the goals of the 10th Five-Year Plan ahead of schedule.

Our successes during the concluding year of the five-year plan depend a great deal on the state of affairs in capital construction. Much responsibility has been laid on construction workers for fulfilling the tight starting program. They will have to put into operation many production sites, including a complex for transshipping potassium-chloride at the Ventspils pre-port plant, a refrigerating unit for preserving 8,000 tons of products at a single time at the seafood market in Riga, a stamp-cutter shop at the "Pirmays Mays" production association, housing units with a total area of more than a million square meters, 29 preschool institutions, 13 schools, and dozens of livestock facilities.

Latvian construction workers correctly understand the tasks which were set before them by the party and government. Their commitments for the concluding year of the 10th Five-Year Plan testify to this. They have pledged to finish construction and installation work for the main building at the sprocket chain plant in Daugavpils and to make 70 additional places available at the Gayl'ezers clinical hospital by the 110th anniversary of the birth of V. I. Lenin. They will erect and reconstruct enterprises that manufacture consumer goods and agricultural structures at a faster pace.

Workers at industrial enterprises, kolkhozes and sovkhoses have taken on large commitments for developing production capacities that have recently been put into operation. They have pledged that each ruble spent for construction or reconstruction will bring dividends in as short a time as possible.

Socialist competition to fulfill commitments ahead of schedule is expanding from day to day. The initiative of Rostovites, which has been approved by General Secretary of the CPSU Central Committee L. I. Brezhnev, is ever spreading more widely at construction sites, enterprises, kolkhozes, and sovkhoses. Its motto "Build ahead of schedule--develop ahead of schedule" is supported by the workers of the republic with fast pace work aimed at completing starting structures as quickly as possible and at developing capacities that have already been turned over.

The Daugavpils general construction trust, the Rezekne inter-kolkhoz construction organization, collectives of the "Rigastroy" SU-58 [Construction Control] trust, the Kekav PMK [expansion unknown] and a number of other construction organizations are skillfully concentrating their capabilities at sites that have been turned over. Workers at the Daugavpils "Rigakhimmash" chemical filament plant and the Ayzpute non-fat dry milk plant are successfully developing production capacities.

However, in a number of places the use of capital investments still leaves much to be desired. The collective of the "Rigapromstroy" trust is mobilizing its capabilities slowly to complete the starting program for the "Pirmays Mays" production association and construction workers at the Riga large panel housing construction trust have still not eliminated the flaws from last year. Development of the production capacities at the Valmiyera glass filament plant, the Bolderay complete wood-pulp processing combine, and the Riga construction materials production association, is still proceeding at a pace much slower than the norm.

A number of shortcomings were caused by circumstantial reasons but much blame rests with the collectives which did not give sufficient attention to capital investment effectiveness. These collectives are obliged, in as short a time as possible, to review their attitude towards putting new capacities into initial operation and developing them and to outline effective measures to achieve greater final results in construction production.

As L. I. Brezhnev emphasized, when speaking to the voters of the Baumanskiy electoral district, you will not find success where they sit with their hands folded expecting any of the problems given above. Yet, on the other hand, if people boldly set about their business, leave room for initiative and make business-like beginnings--success is guaranteed.

In the struggle to complete the starting program ahead of schedule construction workers are obliged first of all to mobilize internal potentials. And they are many. First of all, it is necessary to concentrate personnel and material resources more skillfully at sites that have been turned over, to introduce advanced knowledge and small mechanized pieces on a broader scale, and to question those that lag behind more strictly. More attention on the part of administrators and social organizations should be given to socialist competition that is conducted on the principle of "workers' relay races." Much energy and know-how is needed to be put towards strengthening labor discipline and reducing turnover in personnel.

It is important to regulate the harmonious coordinated work of all parties that are associated with each job site, to increase the responsibility of each party for the outcome of the entire plan as well as for the portion of the work which is entrusted to that party. The best motto for cooperation is "From mutual pretensions to mutual assistance" and it must be followed not in word but in deed.

Unfortunately, the first months of the year testify to the fact that a number of clients and associated parties assist builders poorly. For instance, the Republic Ministry of Agriculture was late in producing technical documentation for a number of sites. Enterprises of the Ministry of the Construction Materials Industry often disrupt the schedule for delivering brick and porous clay filler. Due to the fault of the Ministry of Motor Transport and Highways delays are occurring in completely supplying panels and other structures to job sites. The State Committee for Material and Technical Supply delays the filling of orders by builders for metal. Better deliveries of lumber are still desired.

Party organizations of these and other departments, on whom the initial operation and development of new capacities depend, must strictly control the problems of providing builders with all that is needed. Party gorkoms and raykoms and headquarters that supervise capital construction in cities and villages are urged to concern themselves more with turning sites over on time. Each incidence of disrupting the planned schedules should receive a fundamental appraisal and the guilty parties should pay the penalty that is deserved.

It is necessary to always include the propaganda of advanced knowledge when increasing the demands on all participants in the construction production line. Each initiative that is aimed at accelerating the construction and development of production capacities deserves support in every way possible on the part of administrators and social organizations. Their duty and first responsibility is to utilize the entire arsenal of technological, organizational and

educational means for solving the important tasks of the concluding years of the 10th Five-Year Plan--to unconditionally put all starting sites into initial operation and accelerate the development of new production capacities.

### New Planning Approach

Moscow STROITEL'NAYA GAZETA in Russian 30 Jan 80 p 2

[Article by A. Zveyniyeks, Director of the Planning and Economic Administration in the Latvian SSR Ministry of the Construction Materials Industry: "On the Sector Scale; Collectives in the Latvian Construction Materials Industry Use Standard Net Production"]

[Text] Since the first of January 1980 all enterprises in the Latvian SSR Ministry of the Construction Materials Industry have transferred to planning production according to standard net production.

As is well known, the Moscow construction industry was the first to transfer to planning and evaluating the results of labor according to standard net production. After careful preparations we followed the example of the Main Moscow Construction Materials Industry. Two reinforced concrete structures plants--No 1 and No 3--have transferred to the new index since July 1977 as part of an economic experiment. Almost 40 percent of the total volume of precast reinforced concrete of the republic ministry is turned out at these plants.

Individual net production standards for groups of articles were worked out for these enterprises in accordance with methodological recommendations. Of the total number of about 4,000 names and brands of structures, 34 such groups were made up at one plant and 30 at the other. And in order that the strenuousness of the work of the collectives could be compared an additional index was introduced--the conditionally real cubic meter of reinforced concrete.

The Scientific Research Institute of Reinforced Concrete in the USSR Ministry of the Construction Materials Industry and the Scientific Research Institute of the Economics of Construction in the USSR Gosstroy developed a "Method of calculating the entire labor expenditure for the plant" for us to calculate conversion factors for the conditions of economic agreements. In accordance with it, real production measures for the complete actual labor consumption which have taken place in the sector for 1975 have begun to be determined. Along with this, it has been calculated that plants that are outfitted with new equipment have a coefficient of utilization for equipment of no less than 0.9 for all the principal categories.

for the item--complexity of an article--labor consumption for the most prevalent structure was taken--floor slabs. It became somewhat like the standard. The conversion factors of other articles were established by a corresponding correlation of labor consumption. At first, not production standards were worked out only for two enterprises which were participating in the experiment and conversion factors for determining the volume of reinforced concrete in conditionally real cubic meters were prepared immediately with the long range goal to include all types of products which are turned out in the ministry.

This is the technical part of the matter. However, the ethical side of the problem is no less important. It was necessary, without having as yet any practical examples, to convince workers that the experiment would not result in lower earnings and that something "unprofitable" must become profitable for the state and the enterprise as well as for each worker.

Plant economists, process engineers and other specialists took direct part in the development of net production standards, the conversion factors for the complexity of a structure or an article and the procedures for awarding bonuses to workers in the principal shops. The measures used to conduct the experiment became the basic work program for all structural subdivisions. Simultaneously, the plans for the volume of standard net production and articles in conditionally real cubic meters are confirmed by the plan for the output of gross production and precast reinforced concrete in physical cubic meters. The index for production volume in real units is also kept in the plan when utilizing it as a calculation index for a balanced correlation with the production volume of reinforced concrete for the sector as a whole and comparison with the indices for conditionally real cubic meters as well as for determining material resource requirements.

What, then, were the first results? In 1978, ZhBK-3 [Reinforced concrete combine-3] specializing in the production of reinforced concrete for housing and civil construction, fulfilled the plan for total net production by 101.2 percent and for gross production by 100.7 percent. The goal for labor productivity growth was fulfilled by 112.5 and 101.7 percent, respectively.

Improvements in work also took place at ZhBK-1.

In the USSR Central Committee and USSR Soviet of Ministers Decree "Concerning an Improvement in Planning and Increasing the Influence of the Economic Mechanism to Improve Production Efficiency and the Quality of Work," the standard net production index was assigned a paramount role in planning and evaluating the activities of enterprises, associations and ministries. Considering the knowledge



which is available, the USSR Ministry of Construction Materials Industry approved the decision to transfer all enterprises in the Latvian Ministry of the Construction Materials Industry to planning according to the new index beginning with January 1980.

However, obstacles are arising during its introduction. The first difficulty is that there are no confirmed standards in the centralized system. Their development is proceeding slowly.

It is thought that it would be expedient to instruct the Latvian SSR State Committee on Prices, beginning with 1980, to approve net production standards for new types of articles which are produced by the ministry in the price lists when approving or reviewing wholesale prices.

Since standard net production is becoming a basic indicator, the need to detail the gross production index is becoming less important. At present, all enterprises without exception calculate gross production in the annual plan, distributing volumes of rates of growth between the quarters in increasing totals from the beginning of the year on, and even between the months of the planning and accountable period. When using the net production method, a "lump sum" should be kept only for comparing the yearly plan.

Development of the state plan for economic and social growth, and most of all for net production volume for reinforced concrete enterprises, is also hampered due to a lack of initial data for the production volume of structures and articles on the detailed products list for the planned year. At present the total production volume for our ministry is established by the USSR Gosplan only for certain types of products.

The republic Gosplan establishes quotas for us for manufacturing and delivering precast reinforced concrete by quarters and output volume for only 30 items of the most important structures and articles in all. The sector's enterprises turn out more than 7,000 items, different sizes and brands of structures and articles annually. Therefore, the entire products list for reinforced concrete was divided into 280 groups when working out net production standards.

Concrete plants conclude the fine tuning of the sizes of their orders for precast reinforced concrete in February of the planned year. Consequently, production volumes of reinforced concrete (relative to the group for which standard net production has been worked out) for a majority of types of articles is still unknown at the forming stage of the state plan for next year. Now and when, it is asked,

should the plan for the range of planned indicators be given to production workers? It is hoped that in solving these problems support will come from the principal clients--Latvian SSR Ministry of Construction and the State Committee for Production and Technical Provision of Agriculture and also the republic Gosplan. In conjunction with the transfer of the Ministry of the Construction Materials Industry to the use of the standard net production indicator it becomes possible to tie in this system of standards with other economic indices.

#### Response to Criticism

Moscow STROITEL'NAYA GAZETA in Russian 2 Mar 80 p 2

[Article: "Official Answer to the Letter from Crew Foreman Ya. Rantsean from Riga 'Yours and Someone Else's,' Published in the 10th Issue of the 'Crew Affairs' Section"]

[Text] Comrade Rantsean posed a number of questions in his letter concerning the interrelationships between general contractor and subcontractor organizations. In particular, the general contractor does not provide associated parties with general purpose facilities and does not want mechanics to be part of a subcontractor's crew.

A. Samoylov, Deputy Minister of Construction for the Latvian SSR, answered the criticism: "Comrade Rantsean is correct. Indeed several general contracting organizations do not give subcontractors general purpose facilities, although for the ministry as a whole, providing them is within normal bounds. However, there is a shortage of movable general purpose facilities which are allocated by the USSR Ministry of Construction.

Taking this into consideration, a decision has been approved to adjust the output of general purpose facilities in the area. At the Frontshmontarh Trust a design was developed and comrade Rantsean's crew was charged with implementing it. At the present time work has been completed. The general purpose facilities have a locker area, a drying closet, a shower with hot water, auxiliary facilities, and a lounge.

"Regarding the inclusion of mechanics in crews we will say the following. This requires mutual agreement; however, more often than not it is the crew itself that objects to this, which explains why it is impossible to completely occupy the crane operator due to a lack of materials, temporary transfers of a collective to other sites, etc. Yet the earnings of a mechanic increase at the expense of the crew. Concerning comrade Rantsean's crew directly--a crane operator was included in their group."

From the public editorial board: It is good that the crew's requirements were fulfilled. But crew foreman Ya. Kantsan really posed a much broader question. He wrote not only about his personal resentments but also about typical deficiencies which are characteristic for a majority of the ministry's organizations. Unfortunately, the Latvian Minister of Construction's response was devoted to details but does not answer the main questions: When and how will the requirements of all crews for movable all purpose facilities be satisfied? What is being done so that the crews will willingly accept mechanics into their groups?

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CSD: 1821

## BUILDING MATERIALS

UDC: 331.876.1.008.01

### CEMENT INDUSTRY'S OBLIGATIONS FOR 1980 DETAILED

Moscow TSEMENT in Russian No 3, 1980 pp 2-3

[Unattributed article: "Socialist Pledges of the Branch's Leading Work Forces for 1980"]

[Text] We are publishing below the socialist pledges, discussed and adopted for 1980 at various meetings, of the work forces of the Angarsk Cement-Mining Combine, the Sebryakovskiy Plant, and the Voskresensktsement Production Association.

In the first four years of the five-year plan the Angarsk cement workers produced an additional 101,000 tons of cement, generated 1,130,000 rubles of above-target profit, and completed 1979 pledges ahead of schedule.

The work force at the Sebryakovskiy Plant overfulfilled its targets pertaining to labor productivity growth, improving product quality, increasing production of cement earning the state Seal of Quality, and achieving savings in fuel-energy resources.

The Voskresensk cement workers increased cement production by 503,000 tons in 1976-1979 in comparison with the corresponding period in the 9th Five-Year Plan, and produced above target 61,000 tons of cement and 13,000 tons of powdered limestone.

The work forces of these enterprises, just as all cement workers, welcomed with great enthusiasm and unanimous approval the decisions of the November (1979) CPSU Central Committee Plenum, the theses and conclusions presented in the address by CPSU Central Committee General Secretary Comrade L. I. Brezhnev. Adopting upgraded socialist pledges, they call upon the workers of the cement industry to engage in socialist competition to burst in a worthy manner the 110th anniversary of the birth of V. I. Lenin and ahead-of-schedule fulfillment of the 1980 plan and the 10th Five-Year Plan as a whole.

#### Angarsk Combine

Complete the cement production target by 27 December and the five-year target by the 63d anniversary of the Great October Revolution, and produce an

additional 13,000 tons of cement. All production increase is to be obtained by boosting labor productivity.

A group of measures shall be carried out which shall ensure an increase in production of grade 500 cement to 215,000 tons, and product bearing the Seal of Quality -- to 55%.

Toward these goals:

the second phase of construction shall be completed on the Pereval quarry, and the grinding shop shall be expanded, with installation of two 2.6 x 13 meter mills; the rotary kiln gas scrubbing system shall be upgraded with installation of an OGZ-3-88 electrostatic precipitator, the raw-material mill shall be renovated, with installation of a built-in classifier; the second-lift pump house shall be reequipped; the heat-exchange devices shall be improved on rotary kilns 1, 2, 3; a sealed wet filter and chain mat exchanger shall be installed; a new-design fuel oil burner developed by Yuzhiprotsent shall be adopted; the experience and know-how of the Volga Automotive Plant shall be adopted in improving the comprehensive system of organization of production, labor, management, and wages.

On the basis of strengthening economy measures and efficient utilization of material, raw materials and fuel-energy resources, there shall be achieved savings of 400 tons of standard fuel, 650,000 kilowatt hours of electricity, 100 Gcal of thermal energy, 50 tons of refractories, and 50,000 rubles worth of raw materials and supplies.

No less than 100,000 rubles shall be saved from adoption of efficiency measures. By means of raising the level of mechanization and automation of production processes, there shall be a 12.5% reduction in the total number of workers engaged in manual labor, and the degree of mechanization of materials handling operations shall be boosted to 93%. A total of 1,167 workers, engineer-technician personnel and white-collar workers shall upgrade skills and learn related jobs.

The following pledges have been adopted in the area of improving toiler working, living and recreation conditions:

a total of 5,725 square meters of housing shall be built; boarding facility capacity shall be doubled; a marine and ski facility shall be built; a medical and treatment facility shall go into operation at the preventive clinic; the number of seating accommodations at the dining hall shall be increased by 50%; the new building shall be completed and the outdoor swimming pool at the Pioneer camp be opened for use; the plant greenhouses shall produce 20 tons of cucumbers and 5 tons of tomatoes; the hog farm shall produce 30 quintals of pork.

Direct assistance shall be given to the Kazachinskly Sovkhoz in the spring planting, putting away fodder, and harvesting the crops.



### **Sobryakovskiy Plant**

A total of 3 million tons of cement, including 50,000 tons above target, shall be produced and shipped to this country's construction projects in the final year of the 10th Five-Year Plan.

Above-target product sales shall total 150,000 rubles, with 100,000 rubles of above-target profits generated.

The annual labor productivity growth target shall be overfulfilled by 0.3%, and the five-year target by 1.8%.

Freight car turnaround time on plant tracks shall be reduced by 0.1 hour below the standard figure, thus reducing by 367 cars freight car requirements for shipping cement.

Production of top quality grade cement shall be boosted to 50% of total cement production. The process of manufacturing grade 550 Portland cement shall be put into operation, and not less than 40,000 tons of cement shall be produced.

Efforts shall continue in the area of mechanization and automation of production processes and reduction of labor requirements on auxiliary jobs. The second unit of the cement pulverizing industrial process automatic control system shall start up regular commercial operation at Plant No 2, as shall the plant's industrial process automated management subsystems designed for solving problems of supply and records of movement of materials, marketing and sales of finished product.

There shall be accomplished a changeover to a comprehensive system of production management and organization of labor following the experience and know-how of the Volga Automotive Plant upon 50th Anniversary of the USSR.

Renovation shall be performed on the 170-meter kiln, boosting clinker calcination capacity to 40,000 tons per year.

Working according to the Soviet method "Efficiency certified for each machine and machinery unit," the plant's position as leader in this branch of industry in kiln utilization shall be consolidated. Total designed clinker production capacity shall be exceeded by at least 5%.

The plant's leading position in the branch shall be maintained in the area of specific consumption of fuel and electricity per unit of product produced by the wet process method; savings shall total 150 tons of standard fuel and 800,000 kilowatt hours of electricity.

Savings of not less than 100,000 rubles shall be obtained from adoption of efficiency innovation proposals.

Displaying concern for protecting the environment and for efficient utilization of natural resources, installation shall be completed on the electrostatic precipitator for rotary kiln 3, and quarried-out land shall be reclaimed, returning 7 hectares to agricultural use.

In order to meet the work force social development plan target, 4,100 square meters of housing shall be built, a new plant preventive clinic building, and construction shall commence on an employee services building accommodating 750 persons.

A poultry yard with a capacity of 54,000 birds shall be constructed, and 120,000 tons of mineral fertilizer shall be shipped to destinations in the non-Chernozem zone. The patronaged kolkhos shall be assisted in planting, putting away fodder, bringing in the harvest, and in construction of livestock buildings.

#### Vozkresenskoye Association

Cement production at existing facilities shall be increased by 70,000 tons over the 1970 figure, and product sales shall be increased by 740,000 rubles.

Cement production of 10,000 tons above and beyond the year's target shall be accomplished, with a 150,000 ruble increase in product sales.

New powdered limestone production facilities shall come on-stream by 22 April, and 25,000 tons of this product shall be produced for the non-Chernozem zone.

A total of 34 jobs shall be eliminated by mechanizing and automating production processes; individual and brigade production efficiency accounts shall be adopted.

The labor productivity growth target shall be overfulfilled by 0.3%.

Production costs shall be reduced, generating not less than 100,000 rubles of above-target profit.

Grade 400 Portland cement produced by the Gigant Plant shall earn the state Seal of Quality, boosting the percentage share of top-grade product in total output to 52%.

Above-standard savings of 150 tons of standard fuel and 500,000 kilowatt hours of electricity shall be achieved.

Savings from adoption of scientific organization of labor and efficiency innovation proposals shall produce savings of 100,000 rubles.

At the Vozkresensk Plant kiln No 3 shall be renovated by August 1980, resulting in a clinker output increase of 20,000 tons. At the Gigant Cement Plant

the new system of automatic control of the cement pulverization process shall be in full normal operation by 20 September.

Freight car idle time during loading and unloading operations shall be reduced by 0.1 hour in comparison with the 1979 figure.

In conformity with the comprehensive association work force social development plan, a 72-unit apartment building of 3,900 m<sup>2</sup> shall be constructed, with completion of construction of two buildings at the new Pioneer camp.

All forms of training and schooling offered at the association shall involve enrollment of a total of 1,250 employees, and 300 workers shall upgrade their skills and learn second trades. A total of 60 persons shall be enrolled in correspondence colleges and secondary technical schools.

The Leenoy Sovkhoz shall be assisted in repairing livestock buildings, in cutting and putting away at least 500 tons of hay, and shall be assisted in harvesting 100 hectares of potatoes and 20 hectares of beets.

The right to receive the honored title "Exemplary Enterprise" shall be earned on the basis of meeting adopted socialist pledges.

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SLAG-CONTAINING PORTLAND CEMENTS IN SIBERIAN, FAR EASTERN CONSTRUCTION

Moscow TSEMENT in Russian No 3, 1980 pp 11-12

[Article by R. P. Ivanova et al, engineers, SibNIIproyekttsement, Krasnoyarsk Cement Plant, Kuznetsk Cement Plant: "Slag-Containing Portland Cements for Hydraulic Engineering Structures in Siberia and the Far East"]

[Text] Hydraulic engineering construction experience has demonstrated the effectiveness of employment of slag-containing Portland cement in the interior concrete of monolithic structures and submerged portions of dams which are permanently in water [1, 2].

Slag-containing Portland cements (ShPTs), intended for hydraulic engineering structures in Siberia and the Far East, are produced in conformity with specifications 21-21-4-73, which prescribe limits on content of high-thermal active minerals in the clinker: 44-49%  $C_3S$ , not more than 7%  $C_3A$ , while from 35 to 50% slag content is allowed in ShPTs. Grade 300 slag-containing Portland cement is manufactured with such clinker by the Krasnoyarsk and Kuznetsk cement plants. These compositions of clinker and cement ensure moderate heat release in construction involving monolithic concrete.

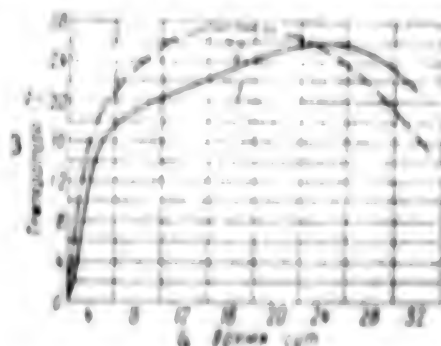
Until recently, it was not recommended that ShPTs be employed for frost-resistant concretes, but practical experience gained in construction of the Ust'-Ilimskaya, Krasnoyarsk, and Zeyskaya GES confirmed the possibility of obtaining with ShPTs concretes with a frost resistance of 100-200 cycles of alternating freezing-thawing.

In connection with the shifting of hydroelectric power construction to areas with particularly harsh climatic conditions and to permafrost areas (Dudayakaya, Nizhne-Yeniseyskaya, Tunguskaya GES), demands on the strength and frost resistance of ShPTs have increased substantially.

In our opinion the stated restriction on  $C_3S$  content in clinker for grades 300 and 400 is unwarranted, since alite exerts decisive influence on forming structure and strength, ensuring a high density, frost resistance and impermeability of cement stone and concrete. To obtain such an aggregate of properties [2, 3], it is recommended that the  $C_3S$  content in the clinker be increased, with a small or moderate quantity of  $C_3A$  (up to 8%).

Previously conducted research by SibNIIproyekttsement (Siberian Scientific Research and Design Institute for the Cement Industry) established that an increase in heat release by increasing the  $C_3S$  content in the clinker can be prevented by somewhat raising the percentage of slag in the cement [4].

There are various opinions on the frost resistance of concretes when the percentage share of slag in the cement is increased. It is proposed that ShPTs with activity not less than 35 MPa with blast-furnace slag content of not more than 40-45% be used for frost-resistant hydraulic engineering concretes [3].



Exothermic heating of blocks measuring 7 x 12 and 5 x 3 meters, poured with employment of slag-containing Portland cements, in construction of the Zeykaya GES

Key:

1. Block No 18-Sh-26, grade 150 concrete, employing experimental grade 300 ShPTs with 52-53%  $C_3S$ , 6-7%  $C_4A$ , and 53-55% slag
2. Block No 20 Sh-26, grade 150 concrete employing specification 21-21-4-73 Krasnoyarsk Plant ShPTs with 45-49%  $C_3S$ , 5-7%  $C_4A$ , and 46-49% slag
3. Temperature
4. Time, days

In the 55-55% slag dosing range, the smallest decrease in frost resistance is observed in ShPTs containing 55% slag [5].

To increase the strength and frost resistance of concrete for hydraulic engineering construction, it is advisable to utilize not only grade 300 but also grade 400 slag-containing Portland cement. At the same time grade 400 hydraulic engineering ShPTs is not produced at Siberian cement plants, and the process parameters for producing it have not been worked out.

We conducted studies for the purpose of selecting an optimal mineralogical and material composition of grades 300 and 400 ShPTs taking account of the requirements of modern hydroelectric power construction. SibNIIproyekttsement, working jointly with the Krasnoyarsk and Kuznetsk plants under laboratory and production conditions, studied a broad variety of slag-containing Portland cements based on clinkers with a content of 45-55%  $C_3S$ , 5-7%  $C_4A$ , and batched with 35 to 60% slag from the Kuznetsk and Western Siberian metallurgical combines.



The results of laboratory tests on grade 300 ShPTs were published in [4].

We present below figures from on-site investigations\* of an experimental batch of grade 300 ShPTs in the concrete of the Zeykaya GES, with a clinker content of 52-53%  $C_3S$ , 7%  $C_3A$ , and 54% slag produced at the Krasnoyarsk Plant.

The experimental ShPTs, just as the slag-containing Portland cement prepared following specification 21-21-4-73, can be used to produce all grades of concretes employed in construction.

Concretes prepared with grade 300 ShPTs with an elevated content of  $C_3S$  in the clinker and a percentage of slag in the cement and concretes of the same grade meeting specification 21-21-4-73 are equal in compressive strength, tensile strength during cleavage, watertightness and frost resistance (Table 1).

Full-scale on-site observations of the state and heating temperature of concrete in the blocks indicated that grade 300 ShPTs with elevated  $C_3S$  content and slag differs favorably from grade 300 ShPTs produced according to specification 21-21-4-73 (see figure). Maximum heating temperature rise in the concrete blocks containing the experimental ShPTs occurred 10-12 days later, and the heat rise was less than in blocks containing ShPTs produced according to specification 21-21-4-73, which diminishes the probability of cracks forming and promotes greater longevity of monolithic concrete.

As a result of investigations and determination of optimal process parameters for producing grade 300 ShPTs for hydraulic engineering structures it was established that clinker of hydraulic engineering composition at the Kuznetsk Plant does not ensure producing grade 400 ShPTs even with maximum (following specification 21-21-4-73)  $C_3S$  content (49%) and a minimum dose of slag (35%) in the cement. It was established that it is possible to obtain grade 400 ShPTs with a sufficient safety factor (42-45 MPa) with 30-35%  $C_3S$  and not more than 7%  $C_3A$  in the clinker. The quantity of slag in Kuznetsk Plant ShPTs should not exceed 35-40% with a fineness of grind leaving 8% residue on a number 008 mesh screen ( $R_{008}$ ), specific surface ( $S_{sp}$ ) comprising 1800-3200  $cm^2/g$ , and in the Krasnoyarsk Cement Plant ShPTs -- not more than 35-40% slag with  $R_{008}$  to 10%,  $S_{sp}$  -- 2600-2800  $cm^2/g$ , and up to 45% slag with  $R_{008}$  -- not more than 8%, and  $S_{sp}$  -- 2600-3000  $cm^2/g$ .

The obtained grade 400 slag-containing Portland cements with elevated  $C_3S$  content (30-35%), and with other standardized parameters in conformity with the requirements of specification 21-21-4-73, are characterized by low heat release. Heat release averages 30-45 and 42-62 kJ/kg lower respectively after curing 1 and 7 days than grade 400 hydraulic engineering Portland cement from the Krasnoyarsk Plant.

\* Concrete studies performed by ZeyaGESstroy Central Construction Laboratory.

Table 1.

1	2	3	4	5	6	7	8	9			
Марка бетона	Прочность бетона при сжатии (МПа) в возрасте 10, сут	Прочность бетона при сжатии (МПа) в возрасте 10, сут	Прочность бетона при сжатии (МПа) в возрасте 10, сут	Прочность бетона при сжатии (МПа) в возрасте 10, сут	Прочность бетона при сжатии (МПа) в возрасте 10, сут	Прочность бетона при сжатии (МПа) в возрасте 10, сут	Прочность бетона при сжатии (МПа) в возрасте 10, сут	Прочность бетона при сжатии (МПа) в возрасте 10, сут			
200 В-8	6,1	12-15	22-28	200 В-8	6,1	12-15	22-28	200 В-8	6,1	12-15	22-28
200 В-8	3,6	12-15	20-29	200 В-8	3,6	12-15	20-29	200 В-8	3,6	12-15	20-29
200 В-8	3,1	11-17	23-29	200 В-8	3,1	11-17	23-29	200 В-8	3,1	11-17	23-29

Key:

1. Cement used
2. Cement consumption, kg/m<sup>3</sup> of concrete
3. Grade of concrete
4. Largest aggregate size, mm
5. Slump, cm
6. Compressive strength of concrete (MPa) at age, days
7. Watertightness of concrete, kg/cm<sup>2</sup>
8. Frost resistance of concrete, alternating freezing-thawing cycles
9. Cleaving tensile strength of concrete, MPa
10. Krasnoyarsk Cement Plant
11. Kuznetsk Cement Plant
12. Grade 300 commercial ShPTs, experimental batch (52-53% C<sub>3</sub>S, 53-55% slag)
13. Grade 300 commercial ShPTs, specification 21-21-4-73 (45-49% C<sub>3</sub>S, 46-49% slag)
14. Grade 300 commercial ShPTs, specification 21-21-4-73 (47-50% C<sub>3</sub>S, 45-46% slag)

Note: Composition of concrete:  
 1:2.43:4.69 for grade 200 V-8 with largest aggregate size = 40 mm; 1:2.53:5.84 for grade 200 V-8 with largest aggregate size = 80 mm. 0.2% SDB of cement by weight added.

Table 2.

1	2	3	4		5	6				7	8	9	10
			Содержание в цементе	Содержание в шлаке		Тонкость помола по ГОСТу, %	Удельная поверхность, м <sup>2</sup> /кг	Прочность по ГОСТу, МПа при возрасте, сут	Прочность при замесе в возрасте, сут				
Оптический метод под маркой 400. Кустарного производства (11)	51	6.0	15.0	4.9	3200	3.7	6.4	24.0	45.3	22	24	22	32
	52	5.3	15.5	7.0	3200	3.8	6.3	25.8	44.8	240	27	240	240
	53	5.8	16.3	7.3	3100	3.5	6.1	24.0	44.5	221	23	251	240
	54	5.1	16.0	6.2	3200	4.5	6.0	24.4	45.5	233	23	233	251
	55	5.6	16.5	6.0	3400	4.5	5.6	26.0	45.0	233	23	233	260
Оптический метод под маркой 400. Кустарного производства (12)	51	6.5	15.0	9.0	2700	4.3	6.4	25.1	45.6	240	27	272	266
	51	7.0	16.0	9.3	2600	4.3	6.2	27.3	43.1	213	21	256	266
	53	6.2	15.0	10.0	2600	4.0	6.0	21.5	40.1	240	24	258	266
	57	6.3	15.0	7.3	2800	4.3	6.5	21.7	41.4	219	21	260	266
	55	6.0	16.0	10.3	2700	4.9	6.9	22.9	47.2	250	25	260	266
Промышленный порце-лановый цемент марки 400 (по ГОСТу 4793-57) Кустарного производства (13)	51	6.5	16.0	7.8	3000	4.6	6.4	25.2	45.9	246	27	276	324
	47	6.5	—	9.1	2800	5.1	6.9	35.5	49.6	278	27	324	324
	49	6.3	—	12.0	2700	4.0	6.3	34.1	47.9	270	27	313	324
47	6.0	—	11.2	2700	4.9	6.1	34.2	46.9	260	27	270	290	

Key:

1. Cement designation
2. Content in clinker
3. Slag content in ShPTs
4. Fineness of grind -- percentage not passing No 008 mesh screen
5. Specific surface, cm<sup>2</sup>/g
6. Ultimate strength, GOST 310-4-76, MPa
7. Bending strength at age, days
8. Compressive strength at age, days
9. Heat of hydration (kJ/kg), determined by thermos method, GOST 4793-57, at age, days
10. Coefficient of dehydration (K<sub>в</sub>) of slurry with water/cement = 1.0%
11. Experimental-commercial grade 400 ShPTs, Kuznetsk Cement Plant
12. Grade 400 ShPTs, laboratory grind, from Krasnoyarsk Cement Plant clinkers
13. Grade 400 commercial Portland cement (specification 21-21-4-73), Krasnoyarsk Cement Plant

Dehydration, determined by the method described in [6], of grade 400 ShPTs of the Krasnoyarsk and Kuznetak plants is below that of grade 400 Portland cement from the Krasnoyarsk Plant and comprises 27-30 and 25-26 respectively at 30-33% in grade 400 Portland cement. The reduced dehydration of Kuznetak Plant grade 400 ShPTs is due to the higher specific surface figure (Table 2).

Thus the results of our investigations attest to the advisability of utilizing in hydraulic engineering construction grades 300 and 400 ShPTs with elevated  $C_3S$  content (50-55%) in the clinker, while limiting  $C_2S$  content to 7%.

Producing such clinker for hydraulic engineering ShPTs will enable cement plants to improve the technical-economic performance figures for kiln facilities, to reduce somewhat the content of alkaline oxides in cement by reducing consumption of highly-alkaline clay, while increasing the percentage of slag in ShPTs will make it possible to boost cement production.

In non-critical frost-resistant structures, grade 400 hydraulic engineering Portland cement can be replaced by ShPTs of the same grade, diminishing the heat release of the concrete thereby, or one can reduce cement consumption, replacing grade 300 ShPTs in monolithic concrete.

On the basis of the results of the conducted studies, specifications were drafted for grades 300 and 400 slag-containing Portland cement with elevated  $C_3S$  content for hydraulic engineering structures of Siberia and the Far East.

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## METALWORKING EQUIPMENT

### MACHINE BUILDING INDUSTRY IN CEMA FRAMEWORK VIEWED

#### CEMA Machine Tool Industry

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 1, 1980 pp 53-56

[Article by Reinhard Martin, CEMA Secretariat: "New Step in Development of Scientific-Technical Cooperation of CEMA Member Nations in the Area of Machine-Tool Engineering"]

[Text] Machine tool engineering determines technological advances in all areas of machine building. In recent years this important branch of industry has experienced continuous growth and development in the CEMA member nations: output volume has increased substantially, the technical level of manufactured machine tools and machines has risen, and the percentage share of specialized and gang machine tools, automated lines, heavy custom machine tools, numerically-controlled machine tools, and high-output press forging and foundry equipment in total production has increased.

A positive role in boosting the machine-tool industry in the CEMA member nations and raising the technological level of manufactured machine tools and press forging equipment has been played by implementation of measures in this area specified by the Comprehensive Program for Further Deepening and Improvement of Cooperation and Development of Socialist Economic Integration of the CEMA Member Nations.

In 1971-1978 there occurred specialization and co-production in the manufacture of metal-cutting machine tools, press forging equipment, foundry and woodworking equipment, on the basis of more than 10 multilateral international agreements. In addition considerable work was accomplished in the area of scientific and technical cooperation among the CEMA member nations.

Appropriate analyses and forecasts were elaborated in order to determine the principal areas and directions of technical development of machine tools and machinery. Plans for coordination of scientific research and design activities for 1976-1980 were drawn up on the basis of these analyses and forecasts. Accomplishment of these plans will signify

production startup on promising metal-cutting machine tools, press forging and foundry equipment, acceleration of the pace of technological advance, and improvement in the technological level and quality of the products.

Implementation of plans pertaining to coordination of scientific research and design activities has made it possible to establish the requisite scientific and technology lead and has promoted production growth and acceleration of technological advances in this industry. Development of production specialization and co-production during this period has also promoted expansion of scientific and technical cooperation and accelerated adoption of project results.

The subject matter of scientific research projects conducted by the CEMA member nations in 1976-1979 can be characterized by the following examples.

In the area of metal-cutting machine tools scientific and technical cooperation among the CEMA member nations was carried out in the area of designing and putting into production new, promising automated lines for machining parts under conditions of mass production and drafting of recommendations for boosting the technological level of these lines.

In connection with this, an entire group of projects was carried out in the area of standardization of assemblies and components of automated lines for machining parts of the solids of revolution and body parts type. Specifications for the major standardized assemblies for automated lines, such as base assemblies, straight-line feed power tables, spindle boxes, multispindle attachments, and indexing swivel tables, have been drawn up and adopted by the CEMA member nations.

Specialists from the People's Republic of Bulgaria, the GDR, USSR, and Czechoslovak Socialist Republic have jointly prepared technical documentation, have built and tested experimental models of transfer devices of a new type with three gantry-type handling-transfer devices for automated lines, and series manufacture of these items has been set up in Bulgaria and the USSR.

Uniform preliminary specifications for the manufacture of tools and devices for setting them up off the machine tools, designed specifically for automated lines, have been drawn up and coordinated for all CEMA member nations.

Important elements of scientific research activities conducted in the area of designing and building automated lines are elaboration and adoption of general specifications, uniform for all CEMA member nations, for designing automated lines, as well as elaboration of a uniform method of acceptance testing of rigid-path automated lines at the manufacturing plant and at the customer plant, which makes it possible to a significant degree to improve the quality, reliability and durability of these products.

A considerable volume of research activities on a multilateral and bilateral basis has been conducted by all CEMA member nations with the participation of the Socialist Federated Republic of Yugoslavia on designing and putting into production new types of grinding machines, assemblies and components for these machines, and improvement of grinding process operating modes. A method has been developed for technical and economic analysis in the area of efficient employment of high-speed grinding, and general specifications and recommendations have been drawn up on utilization of high-speed center-type cylindrical grinders, as well as on new designs of high-speed centerless circular grinders and surface grinders.

A large number of scientific research and design projects have been carried out in the area of designing standardized component assemblies, parts and tools for grinding machines. For example, uniform specifications for and methods of testing grinder spindle assemblies on antifriction bearings for high-speed grinding ( $V=50-80$  m/sec) with belt drive have been drawn up and accepted for adoption by interested countries (GDR, Poland, Romania, USSR, and Czechoslovakia), and technical documentation has been prepared, experimental models built and test results coordinated on a unit (with filtering materials) for extracting aerosols of grinding machine fluid and recommendations on their utilization.

Technical documentation has been prepared and experimental models built of an automated device for dynamic balancing of grinding wheels on grinding machines, and type-size series of these devices have been coordinated; general specification requirements have been drawn up for safety housing designs and a method of testing them for grinding wheels operating at a cutting speed of up to 100 m/sec, as well as uniform operating safety regulations for them. Recommendations have been adopted on selection of cutting fluids, mode of feed into the grinding zone and optimal pressure for high-speed grinding, as well as on selection of cutting conditions for high-speed grinding.

Practical adoption of scientific research results in the area of grinding processes will make it possible to increase labor productivity, precision of machining, degree of automation, reliability and durability of machine tools, will create the prerequisites for developing advanced designs of component assemblies and tools which boost the technological level of grinding machines and their economic effectiveness, and will also improve grinding machine labor conditions and safety.

The current five-year plan devotes particular attention to multilateral scientific-technical and economic cooperation among the CEMA member nations in the area of designing and manufacturing the most advanced type of metal-cutting equipment, that is, numerically-controlled machine tools and modern component assemblies for these tools.

The above-indicated cooperation has been conducted by the CEMA member nations plus Yugoslavia on the basis of a joint coordination plan for

multilateral conduct of projects in the area of designing modern numerically-controlled metal-cutting machine tools and numerical control systems, a plan ratified by the CEMA Executive Committee.

As result of implementation of measures specified by the coordination plan, the CEMA member nations and Yugoslavia have made a substantial stride forward in designing and setting up manufacture of this advanced type of equipment. Manufacture of numerically-controlled machine tools and machining centers has increased severalfold, and their technological sophistication has appreciably improved.

Scientific and technical cooperation in designing and building numerically-controlled machine tools, modern component assemblies and machining centers was carried out primarily in the area of developing modern products which predetermine the technological level of numerically-controlled machine tools.

To achieve this objective technical documentation was prepared on a multilateral basis, and proposals were accepted for adoption in the member nations pertaining to designing and setting up manufacture of standardized component assemblies for modern numerically-controlled machine tools, such as ball screw pairs, rolling-contact guides, modern numerical control devices based on microprocessor packages and large integrated circuits (LIC), modern electric feed drives with high-torque DC motors, etc.

Technical documentation was prepared taking into account startup of manufacture of modern component assemblies, and experimental models of modern numerically-controlled machine tools and machining centers were built and tested, products which are presently being put into series production.

The design, general layout and arrangement of numerically-controlled machine tools and machining centers are state of the art and provide high productivity and precision machining. Machining centers presently being manufactured are equipped with multiposition tool magazines and automatic tool change devices. Further improvement of design of and production startup on modern component assemblies and numerically-controlled machine tools proper, with the objective of increasing reliability and improving their size-weight performance, are specified by scientific-technical and design coordination plans in order to achieve further improvement in the technological level of these products.

A long-range specific CEMA member nation cooperation program in the area of machine building specifies development of those branches which provide the foundation for its qualitative reorganization. Toward these aims plans call for a number of measures pertaining to economic and scientific-technical cooperation among the CEMA member nations, directed toward:

design, manufacture and expanded production of heavy and custom metal-cutting machine tools for heavy, power and nuclear machine building;

design, manufacture and production increase on modern numerically-controlled metal-cutting machine tools and machining centers for their utilization in small-series and series production;

design and manufacture of new and increased production of existing automated lines, special and specialized metal-cutting equipment;

design and production startup on high-productivity automated press forging equipment as well as means of mechanization and automation;

design and manufacture of standardized sets of line equipment;

design and manufacture of industrial manipulator-robots of various function.

At the present time intensive work is in progress in the CEMA member nations and agencies of the CEMA Permanent Commission for Machine Building.

Alongside drafting of agreements on manufacturing specialization and co-production of the above-enumerated types of equipment, five multilateral agreements on scientific-technical cooperation covering the period 1980-1985 have been drafted and ratified by the CEMA Permanent Commission on Machine Building.

In the current five-year period scientific and technical cooperation in the area of machine tool industry has been carried out by CEMA member nations in conformity with the scientific research and design projects coordination plan. Implementation of multilateral agreements on scientific and technical cooperation begins in 1980, constituting a new stride forward and a new form of cooperation in this area; the obligations of the contracting parties have been spelled out, as have their rights and responsibility for prompt and full completion of research and development projects specified by the programs.

A characteristic feature of these agreements is the fact that the cooperation programs adopted in them are closely coordinated with drafted agreements on manufacturing specialization and co-production and with proposals on deepening and broadening manufacturing specialization and co-production. The subject matter of scientific research projects specifies designing and initiating manufacture of those same advanced types of equipment for which manufacturing specialization and co-production proposals have been drawn up. Thus the aim is for a scientific-technical lead to be built up as a result of conduct of an aggregate of scientific research projects, a scientific and technical lead for future development and deepening of manufacturing specialization and co-production of advanced types of metal-cutting machine tools, including numerically-controlled, press forging machinery and foundry equipment.

The principal area of scientific and technical cooperation in the area of machine tool engineering for the period up to 1986 specified by these agreements is further development and deepening of cooperation in



accomplishing the tasks proceeding from the DTsPS (expansion unknown) in the area of machine building, boosting the technological level of metalworking equipment, as well as acceleration of the pace of equipping machine building with high-productivity automated metal-cutting machine tools and automatic lines, press forging and foundry equipment, and industrial manipulator-robots, providing a higher level of production and labor productivity with minimal outlays. Scientific and technical research and development programs, which are an inseparable part of these agreements, specify a combined approach to solving scientific and technical problems. What this means is elaboration, design and manufacture of the following high-productivity types of metalworking equipment and component items of a high technological level, at the state of the art as regards the latest scientific and technological advances:

numerically-controlled metal-cutting machine tools and component items;

automated lines, special and specialized machine tools, heavy and custom machine tools;

automated forge pressing equipment, means of mechanization and automation for this equipment;

standardized sets of foundry equipment for all foundry processes;

industrial manipulator-robots of various function;

control systems for numerically-controlled machine tools.

The subject matter contained in the programs of cooperation in the area of scientific and technical research and development on numerically-controlled metal-cutting machine tools and component assemblies specifies development of future models of such machine tools for performing a broad range of industrial tasks, including automatic numerically-controlled turret lathes, design, fabrication and testing of experimental models, as well as further improvement and development of new component mechanical assemblies for numerically-controlled machine tools and drafting of preliminary specifications for improving component assemblies. Cooperation among CEMA member nations is continuing in the area of establishing uniform conditions of programming and operating numerically-controlled machine tools and automated sections of numerically-controlled machine tools.

Multilateral international cooperation in the area of automated lines, special and specialized machine tools, heavy and custom machine tools is directed toward developing promising designs of automated lines and gang tools, transfer devices and assemblies for automated lines and readjustable automated complexes for preliminary machining of parts of the solids of revolution type.

Programmable command devices for controlling machine tool and automated line cycles are being standardized and utilized. The program also specifies development of special machine tools for the electronic, instrument engineering and tool industry, as well as promising tool designs. Measures to boost the technological level of heavy and custom machine tools, including through employment of modern polymeric antifriction materials, are being developed and adopted.

Scientific and technical cooperation in the area of machine tool engineering on the basis of agreements is closely coordinated with economic cooperation among the CEMA member nations and at the present time calls for conduct of joint research, development and design of new models of equipment and component assemblies on the basis of extensive standardization, with development to the regular production stage.

In our opinion the lack of clarity in the matter of stage of determination of specializing parties which, following completion of scientific research projects, will initiate production and incorporate obtained research results, constitutes an unresolved problem in the area of scientific and technical cooperation and difficulties which arise in connection with this.

It would seem advisable, in order to stimulate scientific research efforts, to coordinate these efforts as early as the initial stages and to spell them out in a formal manner in each agreement on scientific and technical cooperation.

Coordination of scientific and technical with economic cooperation promotes a substantial broadening and deepening of manufacturing specialization and co-production as well as development of mutual exchange of metalworking equipment among the CEMA member nations, and fuller satisfaction of the requirements of the machine building industry in advanced items of this product line.

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#### International Specialization

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 1, 1980 pp 57-60

[Article by Zygmund Zytomirski, CEMA Secretariat: "Some Problems of International Manufacturing Specialization and Co-Production in the Area of Machine Building"]

[Text] International cooperative manufacture and co-production is not simply a manifestation of international socialist division of labor. It is a rather high and advanced form of this, with a number of characteristic features. The first of these is concentration of manufacture of similar products in one, two or several countries. The term similar products is usually defined as items which are identical or similar in design and

from a technical standpoint. They are manufactured on the same equipment, as a rule satisfy the same requirement, and only to a certain degree differ in type-sizes. If, however, there are substantial differences in the power or dimensions of a product and its manufacture involves the employment of a different process and equipment, in spite of the identical designation they should not be called similar products in this definition.

International specialization is inevitably accompanied by concentration of production and increase in series production figures. These are two aspects of one and the same process. An essential attribute of international specialization is technical retooling of production, employment of more economical equipment, improvement of the entire organization of labor and, as an end result, low prime cost and high product quality. Precisely this dictates the principal effect of international specialization.

At the present time the bulk (up to 80%) of productive assets and labor in machine building is engaged in the manufacture of parts, assemblies, instruments, etc. For this reason it is precisely here where concentration and technical retooling of machine building are taking place. Today the optimal magnitude of manufacture of component items on the latest equipment runs into millions and tens of millions of units. According to calculations by Czechoslovak economists, the advantages of mass production are measured by the figures contained in Table 1.

Table 1.

	Outlays on Mate- rials	Outlays on Wages	Labor Re- quirements in Norm- Hours	Full Produc- tion Costs
Small-series production	100	100	100	100
Series production	93.5	51.3	54.5	67
Mass production	76.0	8.5	10.5	41.8

According to an estimate by Soviet economists, part, assembly and manufacturing process specialization makes it possible to reduce societal labor outlays by 33-50%, and live labor outlays by 60-67% and sometimes by as much as 80%.

Therefore the CEMA member nations are concluding an increasing number of agreements pertaining to specialization and co-production in the manufacture of parts and assemblies. In Czechoslovakia, for example, such agreements presently comprise more than one third of the total number of signed long-term multilateral and bilateral division of labor agreements in machine building. On the basis of multilateral agreements Czechoslovakia produces the following: machine tools -- 14 kinds of component units out of 96 list items; bearings -- 727 out of 2548; hydraulic equipment items -- 157 out of 523; etc.

Bilateral manufacturing specialization and co-production agreements in Czechoslovakia's overall machine building industry specify the following: supply of hydrostatic drives for grain combine harvesters to the GDR; co-production with the GDR in the manufacture of principal components for automobiles; import of truck rear axles from Hungary; supply of component parts and assemblies for STB looms to the USSR and import of these looms from the Soviet Union; supply of spindles for BD 200 spinning chambers to the USSR; etc. The CEMA member nations have amassed the greatest experience in international cooperative manufacture in the automotive industry, machine tool industry, tractor industry, agricultural machine building and shipbuilding, and in the production of heavy construction and road building equipment. As a rule cooperative manufacture in these areas is of a unidirectional nature. This signifies that one of the partners manufactures parts and assemblies for the final product, which it receives in exchange, in agreed-upon volumes.

For example, in 1976-1980 Poland will ship to AvtoVAZ in Tol'yatti 2,550,000 sets of product items of 19 designations and in turn will receive Lada automobiles. A portion of these Polish exports will be compensated by counterflow shipments of Soviet parts and assemblies for the Fiat-125 P.

On the basis of a cooperative manufacturing agreement, Poland also manufactures and ships to the USSR each year 50,000 sets of brake and other equipment for KamAZ trucks, assemblies for STB shuttleless looms, transmissions, rear axles and drive shafts for construction and road building equipment, components and assemblies for electronic computers, tape recorders, cash registers, etc.

Soviet and Polish experts designed electromagnetic clutches, manufacture of which was set up at a plant in the town of Ostrzeszow (Poland). This enterprise ships to the USSR each year 400,000 couplings for metal-cutting machine tools.

Similar agreements have also been arranged between other CEMA member nations, both on a bilateral and multilateral basis.

This promising form of cooperation will experience particular growth in future years. The CEMA Permanent Commission on Machine Building has already adopted proposals pertaining to manufacturing specialization and co-production of a large number of product items. For example, coordinated manufacturing specialization covers 892 hydraulic and 300 pneumatic assemblies.

The Commission has adopted recommendations that countries conclude appropriate agreements on components and process equipment for metal-cutting machine tools, encompassing 10 consolidated groups of product items consisting of 41 type sizes.



Beyond 1980, plans call for extensive development of cooperative manufacture in agricultural machine building and in the manufacture of trucks, equipment for nuclear power plants, ships and platforms for offshore oil and gas exploration and production, complete industrial process installations, as well as in the aircraft industry.

These and other measures elaborated within the framework of CEMA attest to a significant acceleration of the process of international manufacturing specialization and co-production of parts and assemblies. There still remains unutilized potential here, however. For example, the above-mentioned proposals pertaining to hydraulic equipment and metal-cutting machine tools do not fully eliminate parallelism and duplication. This naturally cannot help but influence the effectiveness of planned measures.

As practical experience indicates, in elaborating tactics and strategy of deepening international socialist division of labor, the emphasis should be shifted to matters pertaining to product quality. Comrade A. N. Kosygin, Chairman of the USSR Council of Ministers, stated at the 33d CEMA Session that a highly-developed multibranch machine building industry has been established in all the European CEMA member nations, an industry which is turning out products covering practically the entire world product item list. These include many fine machines. Problems of technological level and quality of many types of equipment, however, have not yet been resolved.

The fact is that production cooperation, carried out on the basis of bilateral and multilateral agreements on international manufacturing specialization and co-production and via traditional foreign trade channels, is many times not subordinated to development, adoption and delivery of new, technologically and economically advanced products. These agreements frequently specify requirements based on the performance specifications of equipment currently being manufactured, not that equipment which will meet tomorrow's requirements. And this is happening at a time when countries are currently drafting a machine building program which for all practical purposes will determine the qualitative level of productive assets two decades into the future.

In order to boost the technological level of machine building, it is essential to take a number of effective measures both in mutual cooperation and in each country. First of all one should evidently concentrate scientific-technical and machine building potential in the main areas, where the greatest practical return can be obtained in the next five-year plan, fully utilizing the advantages of international manufacturing specialization and co-production. We are directed toward this by the understanding among the leaders of the brother parties that these next two five-year plans are to be transformed into a period of intensive specialization and cooperative manufacture.



With this objective one should perform an analysis of the technological level of products involved in mutual exchange of goods, identify obsolete items, and draft recommendations on improving the qualitative parameters of equipment. In the future this should be done on a systematic basis.

Development of manufacturing specialization and co-production within the framework of CEMA requires further improvement of the mechanism of economic relations, elaborated by joint efforts. It is based on agreements or contracts between government or authorized economic agencies, specifying resolution of economic, production, scientific-technical and a number of other matters. Conclusion of these agreements is preceded by a great deal of work by these agencies and by direct contacts between ministries and government agencies.

As we know, international manufacturing specialization and co-production within the framework of CEMA is developing on a bilateral and multilateral basis. Two types of agreements are in conformity with these -- bilateral and multilateral. Both types have become quite widespread. They possess identical economic content, since their task is mutual satisfaction of requirements for a given product and securing of favorable conditions for technological advance by means of concentration of efforts, scientific and technical potential, production capacity, and material resources. Such agreements ensure a stable character to international socialist division of labor in the area of machine building, guarantee mutual benefits to manufacturers and customers, and ensure precise observance of obligations performance of which determines the even flow and efficiency of production.

At the present time a large number of agreements are in the process of implementation. Such countries as the USSR, GDR, Poland and Czechoslovakia have each signed more than 100 agreements.

In addition to this, from adoption of the Comprehensive Program to the end of 1978, based on recommendations by the CEMA Permanent Commission on Machine Building, CEMA member nations have signed 80 multilateral agreements covering 10,000 product item designations.

The largest agreement, by scale and expenditures, pertaining to development of international socialist division of labor within the framework of CEMA in the area of machine building pertains to multilateral international specialization and cooperative manufacture, with mutual supply of equipment for nuclear power stations. The enormous expenditures on construction of nuclear power stations, as specified by the agreement, are justified by the fact that putting these nuclear generating plants on-line will make it possible to achieve annual savings of more than 70 million tons of standard fuel.

An important achievement of multilateral specialization and cooperative manufacture is the fact that today approximately 75% of product items covered by specialization are to be produced in not more than two countries, and approximately 45% are to be manufactured only in a single country.

This promotes improvement in the economic effectiveness of the branch and helps satisfy the countries' requirements in these products. It plays a major role in increasing the percentage share of machinery and equipment in mutual trade, as is evident from Table 2.

Table 2 (percentages)

	1970 r.	1975 r.	1976 r.	1977 r.	1978 r.
Bulgaria	31	44.8	47.3	49.8	32.4
Hungary	45	45.3	46.6	47.1	49.5
GDR	60	61.7	63.4	63.2	64.8
Poland	52	51.3	53.8	55.6	55.5
Romania	28	35.4	33.7	35.7	40.6
USSR	22	23.0	25.6	25.8	26.0
Czechoslovakia	59.8	57.1	58.2	60.2	62.0
Total, CEMA Member Nations	40	38.6	40.4	41.0	43.9

Pursuant to long-term trade agreements, in the period 1976-1980 export of machinery and equipment in mutual trade among the CEMA member nations will have totaled 90 billion rubles, as compared with 52 billion in 1971-1975 and 27 billion in 1966-1970.

According to preliminary figures, mutual shipments of machinery and equipment among the CEMA member nations in 1979 totaled 21.3 billion rubles, exceeding the 1975 level by 55.5%.

Drafting of long-range specific cooperative programs and bilateral specialization and cooperative manufacturing programs for the period up to 1990 constitutes a new stage in expansion and deepening of international socialist division of labor in the area of machine building. These programs will be organically intercoordinated and will constitute evidence of the unity of areas of cooperation common to all countries and specific bilateral economic ties.

DTsPS [expansion unknown] in the area of machine building has the task of ensuring a high growth rate in manufacture of modern types of equipment, machinery and instruments in order to do a better job of supplying the most modern equipment to the fuel and raw materials branches, agriculture and the food processing industry, as well as machine building proper, and extensive adoption of advanced manufacturing processes. For the major product designations plans call for implementing an aggregate of measures including development of manufacturing specialization and co-production, expansion of existing and establishment of new production facilities.

The objective is concentration of the efforts and resources of the brother countries and division of labor among these countries for development and

manufacture of high-productivity equipment which would be equal or superior to the finest world standards. Special attention is focused on boosting the technological level of products, development of capabilities for most efficient utilization of and economizing in fuel-energy and raw material resources, and reduction of live labor outlays.

The long-range specific program of cooperation in machine building defines a coordinated strategy of cooperation among the CEMA member nations extending far into the future in this industry and constitutes concretization and further development of the comprehensive program of further deepening and improvement of cooperation and development of socialist economic integration of the CEMA member nations.

Pursuant to the understandings reached in the Crimea between CPSU Central Committee General Secretary L. I. Brezhnev, Chairman of the Presidium of the USSR Supreme Soviet, and the leaders of the other brother parties, work is being completed on drafting of bilateral long-term programs of specialization and cooperative manufacture between the USSR and a number of other CEMA member nations.

The first of these -- the General Program of Specialization and Cooperative Manufacture in the Area of Material Production Between the USSR and the People's Republic of Bulgaria up to 1990 -- was signed in Sofia in September, while the second -- between the USSR and the GDR -- was signed in November 1979.

Drafting of similar bilateral programs between other CEMA member nations is presently in the completion stages.

These documents reflect the principles, basic goals and tasks of long-term cooperation, specify the principal areas of specialization and cooperative manufacture in the most important branches and sectors of the economy, and specify the mechanism of implementation of agreed-upon measures.

The principal goal of the general programs is to provide maximum assistance in accomplishing the strategic tasks of building socialism and communism, growth of the economic potential of the brother countries, and securement of dynamic and efficient growth and development of this potential. Securement of these goals will be ensured by strengthening the interaction of the economies of the brother nations and by deepening of mutually beneficial and rational division of labor among them.

The general programs assign a special role to cooperation in the area of machine building. Focusing the planning and economic agencies of these countries on comprehensive solution of the problems of scientific and technological progress, greater concentration and an improvement in the technological level of production, they specify concrete areas of cooperation in this branch.

At the present time one of the principal areas of specialization in Bulgarian machine building is the manufacture of electric trolleys, lift trucks, electric stackers and electric trolleys, as well as electronic computer hardware. Bulgaria supplies to the USSR on a cooperative manufacturing basis many component items for the Lada automobile. Specialization is being set up in the machine tool and tool industry, in manufacture of construction and road building equipment, textile machine building, tractor and agricultural machine building, the oil refining and petrochemical industry, as well as in a number of other branches of industry.

These areas experienced further development in the General Program. Future cooperation in the area of machine building will be primarily of a combined or comprehensive character, encompassing conduct of scientific research and design activities, including exchange of scientific and technical project results, and production on the basis of joint development and division of labor in the manufacture of new machinery and equipment.

Development of cooperation in the area of machine building promotes establishment of a large machine building base in the CEMA member nations, which will basically meet their requirements in all types of machinery and equipment.

In these past 30 years the Council for Economic Mutual Assistance has done much to promote expansion and deepening of international specialization and cooperative manufacture in machine building. This form of cooperation is acquiring particular importance at the present stage, when the Communist and worker parties of the CEMA member nations are placing as a cornerstone of their economic policy tasks of intensification of economic growth, improvement in production efficiency and quality.

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#### CEMA Specialization, Cooperation

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 1, 1980 pp 61-63

[Article by Statistics Division, CEMA Secretariat: "Level of Production Specialization and Co-Production in Machine Building in the CEMA Member Nations"]

[Text] Multilateral international specialization and production cooperation constitutes one of the principal directions of growth and development of economic and scientific-technical cooperation among the CEMA member nations in machine building. This leading branch of industry is growing at a rapid pace, running ahead of the growth of industry as a whole. Constituting the most dynamic branch of industry in the CEMA member nations, it is the fundamental base for providing the economies of these countries with machinery and equipment.

In the period 1951-1978 machine building output volume increased 99-fold in Bulgaria, 14-fold in Hungary, 16-fold in the GDR, 43-fold in Mongolia, 67-fold in Poland, 101-fold in Romania, 29-fold in the Soviet Union, and 18-fold in Czechoslovakia.

The rapid rate of growth of the machine building industry has led to an increase in its percentage share of total industrial output. Table 1 shows growth dynamics for the last 18 years.

Table 1 (percentages)

	Percentage Share of Machine Building in Industrial Output (Gross Output)		
	1960	1971	1978
People's Republic of Bulgaria	42.3	21.4	28.2
Hungarian People's Republic	28.1	28.5	30.8
German Democratic Republic	24.5	11.2	12.7
Republic of Cuba			10.9
Mongolian People's Republic	2.3	1.4	1.1
Polish People's Republic	15.9	11.1	11.9
Socialist Republic of Romania	24.1	42.5	44.2
USSR	20.1	24.3	25.0
Czechoslovak Socialist Republic	24.8	12.2	21.2

The structure of this branch of industry has also changed considerably. This is connected with accelerated growth of the most progressive and dynamically developing industries such as electrical equipment and radio engineering, electronics, instrument engineering, production of means of automation and computer hardware, numerically-controlled machine tools, transport machine building, etc.

Increase in the scale of machine building with the simultaneous development of new subbranches and types of manufacturing facilities and processes, as well as continual expansion of the product mix and improvement in the technological level of the manufactured products demand continuous deepening of international socialist division of labor.

In the last two decades the CEMA member nations and CEMA agencies have been conducting systematic planning work on boosting the level of international manufacturing specialization and co-production in the area of machine building. Since the date of adoption of the Comprehensive Program, interested CEMA member nations have signed 80 multilateral agreements pertaining to machine building product specialization, covering more than 10,000 product items. Several hundred agreements have been signed on a bilateral basis.



International specialization has been arranged first and foremost in the manufacture of new kinds of machinery, equipment, instruments, and complete manufacturing process lines, ensuring further adoption into the national economy of advanced industrial processes, total mechanization and automation of production on the basis of utilization of the latest scientific and technological advances.

Broadening and deepening of international socialist division of labor promote intensification of foreign trade and formation of a more favorable export structure. Bulgaria is one of the principal suppliers of electric motors, electric trolleys, electric telfers, agricultural machinery, and communications equipment to the international socialist market. Hungary manufactures and exports to the other CEMA member nations electrical equipment, buses, mopeds and other means of transportation, medical equipment, vegetable-growing, garden and orchard equipment. The GDR specializes in the manufacture of computers, optical and precision equipment, trucks, passenger railcars, in chemical machine building and machine tools. Poland supplies its partners with products of the shipbuilding industry, agricultural machine building, mining equipment, electrical equipment, etc. Romania manufactures and exports oil drilling and petrochemical equipment, agricultural machinery, freight cars, small and medium oil tankers, and machinery for light industry. For the Soviet Union the list of specialized machine building products covers a broad range of machinery and equipment. These include: complete equipment for electric power stations and metallurgical plants, metal-cutting machine tools, press forging and materials handling equipment, road and road building equipment, tractors and other agricultural machinery, bearings, etc. Czechoslovakia is developing, for its own needs and those of its CEMA partners, the manufacture of equipment for the metallurgical industry, electric locomotives, diesel yard locomotives, metal-cutting machine tools, computers, streetcars, automobiles and motorcycles.

Table 2.

	1 Индексы роста в 1978 г. по сравнению с 1970 г.		
	2 валовой продукция машиностроения	3 экспорт машин и оборудования в страны — члены СЭВ	4 импорт машин и оборудования из стран — членов СЭВ
5 НРБ	13.20	33.37	7.86
6 ВНР	4.12	8.77	8.60
7 ГДР	3.72	5.68	18.67
8 ПНР	9.05	13.00	9.90
9 СРР	15.54	13.73	8.81
10 СССР	6.90	13.56	8.15
11 ЧССР	3.91	6.40	8.16

Key to Table 2 on preceding page:

- |   |                    |
|---|--------------------|
| 1. Growth indexes, 1978 in comparison with 1960               | 5. Bulgaria        |
| 2. Machine building gross output                              | 6. Hungary         |
| 3. Export of machinery and equipment to CEMA member nations   | 7. GDR             |
| 4. Import of machinery and equipment from CEMA member nations | 8. Poland          |
|   | 9. Romania         |
|   | 10. USSR           |
|   | 11. Czechoslovakia |

Table 3 (percentages)

	Export		Import	
	1960	1978	1960	1978
Bulgaria	14.8	52.4	50.0	43.1
Hungary	46.8	49.5	35.7	18.6
GDR	50.6	64.8	11.9	40.2
Poland	28.0	56.5	33.4	41.6
Romania	16.1	40.0	36.1	35.4
USSR	13.5	26.0	44.1	47.5
Czechoslovakia	18.2	62.0	29.1	42.9

Table 4

	1 Exports of specialized products in 1978, as percentage of total machine building products export, %		2 Percentage share of export of specialized products in total machine building products export, %		
	1972	1978	1972	1978	1978
3 GDR	975	131	57.1	36.7	42.4
4 HRP	731	127	14.0	43.5	50.6
5 FAP	451	122	18.9	40.0	43.8
6 HRP	370	111	15.7	26.0	26.7
7 CIP	200	104	8.5*	44.1	38.4
8 CCCP	280	113	18.1	23.6	23.3
9 UCCP	314	114	11.4	29.5	30.0

Key:

- |   |                   |
|---|-------------------|
| 1. Export of specialized products in 1978, as percentage of                                     | 4. Hungary        |
| 2. Percentage share of export of specialized products in total machine building products export | 5. GDR            |
| 3. Bulgaria   | 6. Poland         |
|   | 7. Romania        |
|   | 8. USSR           |
|   | 9. Czechoslovakia |

\* Figures only on multilateral agreements

Table 5 (percentages)

Year	1	2	3	4	5	6	7	8
		НРБ	ВНР	ГДР	ПНР	АРР	СССР	ЧССР
(9) Metalworking equipment								
1973		...	3.7	14.6	...	...	11.2	7.7
1975		6.4	20.4	27.3	31.8	20.9	10.5	8.9
1978		15.8	52.7	54.3	63.5	...	45.7	59.0
(10) Power and electrical equipment								
1973		14.5	—	2.0	...	...	4.2	1.9
1975		21.8	—	3.5	4.5	...	2.7	1.9
1978		33.2	11.7	26.1	18.8	...	8.3	6.5
(11) Mining, metallurgical and petroleum equipment								
1973		—	—	25.7	...	...	5.6	9.9
1975		—	—	37.8	...	33.3	2.0	2.5
1978		98.8	25.0	31.3	9.9	...	3.0	5.0
(12) Materials handling equipment								
1973		81.1	—	1.3	...	...	21.5	—
1975		75.0	—	22.9	...	...	19.3	38.5
1978		82.6	71.6	43.3	10.9	...	43.6	23.5
(13) Equipment for chemical, forest products, paper, construction and other industries								
1973		7.7	3.8	10.5	...	...	29.9	2.1
1975		13.2	7.5	7.4	11.1	21.7	35.8	9.4
1978		14.8	41.2	47.3	38.1	...	22.7	28.6
(14) Tractors, agricultural machinery and equipment								
1973		44.2	10.3	31.4	...	...	41.1	22.5
1975		43.2	8.7	35.4	47.9	33.4	32.8	18.3
1978		57.9	49.8	47.9	72.1	92.1	43.6	49.5
(15) Means of transportation and auxiliary equipment								
1973		34.3	—	47.4	...	...	17.1	19.1
1975		27.8	—	57.7	19.3	82.7	14.8	26.0
1978		31.7	65.3	60.6	34.6	...	25.5	40.0

## Key:

- |                                    |  |
|------------------------------------|--|
| 1. Years                           | 11. Mining, metallurgical and petroleum industry equipment                           |
| 2. Bulgaria                        | 12. Materials handling equipment   |
| 3. Hungary                         | 13. Equipment for chemical, forest products-paper, construction and other industries |
| 4. GDR                             | 14. Tractors, agricultural machinery and equipment                                   |
| 5. Poland                          | 15. Means of transportation and auxiliary equipment                                  |
| 6. Romania                         |  |
| 7. USSR                            |  |
| 8. Czechoslovakia                  |  |
| 9. Metalworking equipment          |  |
| 10. Power and electrical equipment |  |

A graphic example of accomplishing large-scale economic tasks on the basis of international specialization and cooperative manufacture is development of the automotive industry. The Soviet Union, for example, has bilateral agreements with Bulgaria, Hungary, Poland and Czechoslovakia on cooperative supply of components for the Volga Automotive Plant. Cooperative-delivery items include batteries, starter motors and generators from Bulgaria, Hungarian radios and dashboards, Czechoslovakian headlights, and Polish shock absorbers. In exchange the Soviet Union supplies automobiles to these countries.

Specialization and co-production agreements in the manufacture of component parts and assemblies in the automotive industry have also been concluded by Hungary and Poland, Hungary and Romania, Hungary and the USSR, Bulgaria and Czechoslovakia. Expanding cooperation among the CEMA member nations is also occurring in the manufacture of trucks.

As practical experience indicates, development of the machine building industry in each CEMA member nation is directly linked with that country's participation in international socialist division of labor. The most general expression of this link is provided by the machine building production growth figures in comparison with figures on export and import of machine building products among the CEMA member nations.

Comparison of machine building production and mutual product export indexes for specific periods is one of the principal indicators of the rising level of international specialization and cooperative manufacture. Table 2 contains figures for 1960-1978.

The level of international specialization in machine building production by the CEMA member nations and its structure can be characterized by the following indices: percentage share of mutual export and import of machine building products in total mutual exchange of goods (Table 3).

Major improvements in international socialist division of labor in the area of machine building took place in the mid-1970's. They were manifested, in particular, in a rapid increase in the number of agreements on manufacturing specialization and co-production and in growth of the percentage share of specialized products in total machinery and equipment export volume in mutual trade among the CEMA member nations.

For the period 1973-1978 the volume and percentage share of specialized products\* in total machine building export volume are characterized by the figures contained in Table 4.

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\* As a rule the CEMA Permanent Commission on Statistics considers as specialized products goods the manufacture of which is in conformity with bilateral and multilateral agreements (contracts) concluded by the CEMA nations. Since 1973 figures have been kept according to the system of statistical indices recommended for use by the member countries.

A trend of increase in the percentage share of specialized products is typical for all CEMA member nations. In 1978 the following achieved the highest figures in this area: Hungary -- 50.6%; GDR -- 43.8%; Bulgaria -- 42.4%; Romania -- 38.4%.

There has been a substantial rise in the percentage share of export of specialized machine building products in the last four years: in Bulgaria -- from 35.7% in 1975 to 42.4% in 1978; Hungary -- from 23.6 to 50.6%; GDR -- from 25.9 to 43.8%; Poland -- from 18.3 to 26.7%; Romania -- from 36.2 to 38.4%; USSR -- from 16.7 to 23.3%; Czechoslovakia -- from 14.4 to 30%.

The percentage share of export of specialized products has increased at a particularly rapid rate for those machine building subbranches which manufacture metalworking, power and electrical equipment; tractors and agricultural machinery, equipment for the chemical industry, forest products, pulp-paper, and construction industry. Table 5 contains figures for 1973-1978 for various product groups.

Factors promoting a rise in the level of international manufacturing specialization and co-production in machine building include the following, in particular: coordination of the national economic plans of the CEMA nations on a multilateral and bilateral basis, plan-conformable work on production specialization and cooperative manufacture in CEMA agencies, and the traditionally-established mutual exchanges of machinery and equipment.

Growth and development of international specialization and cooperative manufacture is being accompanied by continuous growth of mutual deliveries of machinery and equipment, the percentage share of which was 43.9% of the total mutual trade of the CEMA member nations in 1978, a figure which is continuing to grow.

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